49744/B

Gallery
~~IDG. 64 (2)~~

STEPHENSON
C

2210109791

61.E.12 29175

Payne 1911

MEDICAL BOTANY;

OR,

ILLUSTRATIONS AND DESCRIPTIONS

OF THE

Medicinal Plants

OF THE LONDON, EDINBURGH, AND DUBLIN PHARMACOPŒIAS,

COMPRISING

A POPULAR AND SCIENTIFIC ACCOUNT OF

POISONOUS VEGETABLES

INDIGENOUS TO GREAT BRITAIN.

BY JOHN STEPHENSON, M.D. F.L.S.

GRADUATE OF THE UNIVERSITY OF EDINBURGH;

AND

JAMES MORSS CHURCHILL, F.L.S.

MEMBER OF THE ROYAL COLLEGE OF SURGEONS AND FELLOW OF THE MEDICO-BOTANICAL SOCIETY OF LONDON.

NEW EDITION.

EDITED BY

GILBERT T. BURNETT, F.L.S.

PROFESSOR OF BOTANY IN KING'S COLLEGE, LONDON; TO THE MEDICO-BOTANICAL SOCIETY; AND TO THE SOCIETY OF APOTHECARIES, AND DEMONSTRATOR IN CHELSEA GARDEN.

VOL. II.

LONDON:

JOHN CHURCHILL, PRINCES STREET, SOHO.

MDCCCXXXV.

Gallery
120 (2)

WELLCOME
HISTORICAL
MEDICAL
LIBRARY

LONDON:
IBOTSON AND PALMER, PRINTERS, SAVOY STREET, STRAND.

ALPHABETICAL INDEX

TO

VOL. II.

	Plate
Æsculus Hippocastanum	68
Acacia Catechu	76
Acacia vera	77
Aloe vulgaris	109
Aloe Socotrina	110
Amomum Grana Paradisi	106
Angelica Archangelica	83
Anthemis Pyrethrum	97
Anchusa tinctoria	122
Arnica montana	123
Arbutus Uva Ursi	91
Allium Sativum	111
Canella alba	66
Cetraria Islandica	69
Chelidonium majus	86
Cicuta virosa	89
Citrus Medica	92
Cochlearia Armoracia	114
Colchicum autumnale	70
Coriandrum sativum	94
Crocus sativus	101
Curcuma Zedoaria	107
Cytisus Scoparius	67
Daphne Mezereum	65
Diosma crenata	121
Erythræa Centaurium	118
Eugenia Caryophyllata	95
Fucus Helminthocorton	108
Fucus vesiculosus	108

	Plate
Guaiacum officinale	90
Helleborus orientalis	87
Krameria triandria	72
Laurus nobilis	125
Matonia Cardamomum	106
Melaleuca Cajaputi	84
Menyanthes trifoliata	85
Mercurialis perennis	78
Myristica Moschata	104
Myroxylon Peruiferum	102
Myrtus Pimenta	124
Pastinaca Opoponax	98
Pinus Abies	75
Pinus balsamea	74
Pinus Larix	75
Pinus sylvestris	73
Polygala Senega	103
Prunus Lauro-cerasus	117
Pyrola umbellata	93
Pyrus Cydonia	115
Ranunculus acris	82
Ranunculus Flammula	82
Rhamnus catharticus	119
Rhododendron Chrysanthum	80
Roccella tinctoria	69
Rosa canina	100
Rosa Gallica	99
Ruta graveolens	71
Sambucus nigra	79
Solidago virgaurea	105
Styrax Benzoin	112
Swietenia febrifuga	81
Tamarindus Indica	88
Tanacetum vulgare	116
Triticum hybernum	113
Zingiber officinale	96



Daphne Mezereum.

LXV

DAPHNE MEZEREUM.

Common Mezereon, or Spurge-olive.

Class VIII. Octandria.—*Order* I. Monogynia.

Nat. Ord. Vepreculæ, *Lin.* Thymelææ, *Juss. De Cand.* &c. Thymeleaceæ Thymelidæ, *Burn.*

Gen. Char. *Calyx* coloured, inferior, 4-cleft. *Berry* 1-seeded.

Spec. Char. *Flowers* ternary, sessile on the stem. *Leaves* lanceolate, deciduous.

Syn.—Chamelæa Germanica, sive Mezereon, *Ger. Em.* 1402.
Daphnoides, *Matth. Vulgr. v.* 2. 557, *f.*; *Camer. Epit.* 937. *f.*; *Fuchs. Hist.* 227. *f.*
Thymelæa, *n.* 1024. *Hall. Hist.* 227. *v.* 1. 438.
Daphne Mezereum, *Lin. Sp. Pl.* 509; *Willd. v.* 2. 415; *Fl. Brit.* 420; *Eng. Bot. v.* 20. *t.* 1381; *Woodv. t.* 23; *Stokes, v.* 2. 372; *Fl. Dan. t.* 268; *Bull. Fr. t.* 1.

Foreign.—*Laureole Gentile*, Fr.; *Mezereo, Daphnoide, Biondella*, It.; *Laureola-hembra*, Sp.; *Mezereo major*, Port.; *Kellerkals*, Ger.; *Woltschje luko*, Russ.

Mezereon is a low shrub, which occurs wild in some parts of England, and produces its flowers in March. It is first mentioned as a native of our island, by Miller, who found it plentifully near Andover, in Hampshire. Since that it has been observed in several other places, as at Laxfield, in Suffolk; in Needwood Forest, Staffordshire; in the beech-woods in Buckinghamshire; at Eastham and Stanford, Worcestershire; near Appleton, Berks; and in Wich-wood Forest, Oxfordshire.

It has a strong root, which gives off a number of small slender fibres covered with a smooth olive-coloured bark. The stem is bushy, with nearly upright alternate branches, covered with a smooth grey bark, and seldom growing above four or five feet high. The leaves are deciduous, lanceolate, scattered, smooth, stalked, about two inches long, and half an inch broad, appearing after the flowers, and accompanied by flower-buds for the next season. The flowers are disposed in clusters, about three together, on the naked branches, with several smooth, ovate

bracteas underneath; they are of a pale rose-colour, fragrant, sessile, monosepalous, tubular, with the lip divided into four deep ovate, spreading segments. The calyx, which constitutes what is usually denominated the flower, resembles a *corolla* in texture, and contains the stamens. The filaments are eight, alternately shorter, inserted into the tube, and supporting roundish oblong anthers. The germen is ovate, superior, bearing a flattish, entire stigma, on a very short style. The fruit is a pulpy scarlet berry, containing a single seed, and is the favourite food of some species of Finch. The seed is pendulous, and exalbuminous. The embryo straight, with a superior radicle. The cotyledons plano-convex; and the plumula small. Of this species of Mezereon there is a variety with white flowers, and yellow or orange-coloured berries.—Fig. (*a*) represents the calyx spread open, to show the insertion of the stamens; (*b*) section of the pistil showing the solitary pendulous ovule; (*c*) fruit; (*d*) section of the fruit, to show the solitary seed; (*e*) section of the seed; (*f*) the embryo.

Qualities.—The bark of the root, which is the part used in medicine, is united to the ligneous fibre by a woolly substance, which is the inner part of the liber. The recent bark is very acrid, and, when chewed, powerfully excites the salivary glands, and creates burning sensations in the mouth, which last for a considerable time. M. Vauquelin has discovered a new vegetable principle in the Daphne *Alpina*, which he calls *Daphnine;* it probably present in most of the other species.

Poisonous Effects.—Several speeies of Daphne are poisonous, and the berries of this plant prove so to man, dogs, wolves, and foxes.* Linneus reports, that a young lady, labouring under intermittent fever, died from hæmoptysis, in consequence of having taken twelve berries of the Daphne *Mezereum*, which had been given with the intention of purging her;† and Vicat states, that an hydropic patient having taken

* Semina ejus in cadaveribus abscondita exhibentur a rusticis Sueciæ lupis et vulpibus, quibus adsumtis pereunt sine mora æque ac a seminibus Strychni. *Linneus Flora Lapponica*, p. 105.

† *Flora* Suecia, No. 338.

the wood of Mezereon, was suddenly attacked with diarrhœa, which was continual, and accompanied with insupportable pains. He had besides, for six weeks, vomitings, which returned every day with extreme violence; although, during the whole time, proper remedies were employed in order to quiet them.*

M. Blatin also narrates the case of a person who took a decoction of the root of Mezereon, instead of marsh-mallow. It occasioned violent pains in the stomach and intestines, accompanied by strong burning sensations in the skin, restlessness, loss of appetite, intense fever, and irregular actions of the tendons. These symptoms were relieved by drinking copiously of a sweetened decoction of marsh-mallow.†

Medical Properties and Uses.—It is very generally allowed that Mezereon is a stimulating diaphoretic, useful in chronic rheumatism; but Dr. Donald Monro, Dr. Russel, Dr. Fothergill, and several other eminent men, have described it as capable of curing venereal nodes, scirrhous tumours, obstinate ulcers, and severe affections of the skin. The extensive experience, however, of that able and scientific surgeon, the late John Pearson, by no means supports the character it had obtained; and as his book is in the hand of but few persons, and cannot be obtained, we are happy to be able to record his opinions:

"Dr. Russel's account of the virtues of Mezereon," says Mr. Pearson, "is delivered with so much candour and fairness, that if it be not calculated to excite high expectations, it certainly contains nothing that can mislead. The seventeen cases which Dr. Russel has recorded, do by no means warrant a stronger form of expression than that which he has adopted; and, although Dr. Home has asserted, that 'this root is a powerful deobstruent in all venereal tumours of the scirrhous kind, when mercury has failed;' the evidence he has adduced of this fact is so scanty and insufficient, that it can scarcely be regarded as forming an addition to Dr. Russel's prior report. From all that I have been able to collect, I feel myself authorized to assert, unequivocally, that the Mezereon has not the power of curing

* *Histoire des Plantes Vénéneuses de la Suisse*, p. 140.
† Roque's *Phytographie Medicale*.

the venereal disease in any one stage, or under any form. If a decoction of this root can reduce a venereal node, when no mercury has been previously given, yet the patient will by no means be exempted from the necessity of employing mercury, for as long a space of time, and in as large a quantity, as if no Mezereon had been taken." Speaking of its power of removing venereal nodes, Mr. P. remarks, "I have given the Mezereon in the form of a simple decoction; and also as an ingredient in compound decoctions of the woods, in many cases where no mercury had been previously employed; but never with advantage to a single patient. I have also tried it in numerous instances, after the completion of a course of mercury: yet with the exception of two cases, when the thickened state of the periosteum was removed during the exhibition of it, I never snw the least benefit derived from taking this medicine. In a few cases of anomalous pains, which I supposed were derived from irregularities during a mercurial course, the Mezereon was of service, after I had tried the common decoction of the woods without success; but, even in this description of cases, I have always found it a very uncertain remedy." In scrofulous cases, when the periosteum was diseased, Mr. P. saw no benefit derived from it; neither did he ever see it do good in cutaneous affections, excepting in two instances of lepra, in which the decoction conferred a temporary benefit. Mr. P. concludes by saying, "Indeed the Mezereon is of so acrimonious a nature, often producing heat, and other disagreeable sensations in the fauces; and, on many occasions disordering the prima viæ; that I do not often subject my patients to the certain inconveniences which are connected with the primary effects of this medicine, as they are rarely compensated by any other important, and useful qualities.*

The bark of the Daphne *Mezereum* is used in France to produce vesication, and to keep up the formation of pus from issues; and that of the D. *Gnidium* is applied to the same purpose.

Off. Prep.—Decoctum Sarsaparillæ Comp. *L.*
Decoctum Daphnes Mezerei. *E.*

* *Observations on the Effects of various Articles of the Materia Medica*, &c. p. 44.



Canella alba.

CANELLA ALBA.

White, or Laurel-leaved Canella.

Class XI. MONADELPHIA.—*Order* I. DODECANDRIA.

Nat. Ord. OLERACEÆ, *Lin.* MELIACEÆ, *Juss. De Cand.* &c. MELIACEÆ MELIDÆ, *Burn.*

GEN. CHAR. *Calyx* 5-sepalled. *Petals* five contorted, filaments forming a pitcher-shaped nectary, to which the anthers adhere. *Berry* sub-trilocular, with one or two seeds.

SPEC. CHAR. *Flowers* in terminal corymbs with 15 stamens; the *leaves* coriaceous, spathulate, and obtuse.

Syn.—Canella peruana, and C. tubis minoribus alba, *Bauh. Pin.* p. 409; *Park.* 1581.
Canella cubane, *Johns. Dendr.* 165.
Canella cinnamomea, *Pluk. Phyt.* 160. *f.* 7.
Canella Winterana, *Gært. Fruct. v.* 1. *t.* 77. *f.* 2.
Canella alba, *Sp. Pl. Willd. v.* 2. 851; *Swartz, Trans. Lin. Soc. v.* 1. 96. *t.* 8; *Woodv.* 2. 318. *t.* 117; *Stokes, v.* 3. p. 12.

FOREIGN.—*Canelle blanche*, Fr.; *Canella bianca*, It.; *Weisser Zimmet*, Ger.

THE *Canella* is a common tree in most of the West India islands, and on the continent of South America, growing in the inland woods, where it attains a considerable size.

The stem rises from ten to fifteen feet in height, very straight and upright, and divided only at the top. The branches are erect, and not spreading; furnished with petiolated leaves, irregularly alternate, oblong, obtuse, entire, of a dark green colour, thick like those of the laurel, and shining. The bark is whitish, by which it is commonly known at first sight in the woods. The flowers, which grow at the extremities of the branches in clusters, upon divided foot-stalks, are small, of a violet colour, and seldom open. The calyx is 5-leaved, and persistent; the sepals are

roundish, concave, smooth, and membranous. The petals are five times as long as the calyx, oblong, sessile, concave, erect, two a little narrower than the others. The stamens are monodelphous, the filaments forming an urceolate tube, sometimes called a nectary, to the outer side of which the anthers adhere. The germen is superior, within the nectary-like tube, ovate, and 3-celled; the style is cylindrical, with three rough, convex, blunt stigmas. The fruit is an oblong, fleshy, 3, or by abortion 1-celled, smooth, black 1-2 seeded berry. The seeds are exalbuminous, the embryo curved, and the cotyledons linear. The annexed plate represents a branch of the tree in flower, and the berries of their natural size.—Fig. (*a*) a flower, with its petals forcibly expanded; (*b*) the fruit; (*c*) the pistil standing on the 3-lobed calyx magnified, with the two stigmas; (*d*) a transverse section of the berry of its natural size, with one seed remaining fixed to the side; (*e*) a seed of the natural size.

About the year 1579, as Captain Winter, who commanded the Elizabeth, which formed part of the squadron under the command of Sir Francis Drake, was sailing through the straights of Magellan, he discovered the Wintera *aromatica*, which yields a bark, first mentioned, described, and named by Clusius, as *Cortex Winteranus*, in compliment to the discoverer.* Clusius was the first, also, to record the introduction of Canella *alba*, about the beginning of the seventeenth century; which Parkinson† says, was in his time often mistaken for Winter's bark: it was John Bauhin,‡ however, who first confounded the names, by styling Cortex Winteranus, Canella *alba:* and although Sir Hans Sloane gave separate descriptions of each in the Transactions of the Royal Society, the botanical distinctions were paid so little attention to by Lemery,§ Pomet, and other writers on the materia medica, that Linneus‖ himself was led into error, and combined two different genera under the name of Laurus *Winterana*. He afterwards separated the Canella *alba* from *Laurus*, and established it as a distinct genus, by the name

* *Exot.* lib. 4. ch. 4. † *Theatr.* p. 1581. ‡ *Hist.* t. i. l. 4. p. 460.
§ *Dict. des Drogues.* p. 170. ‖ *Sp. Plant.* ed. i. p. 371. n. 11.

Winterania; under which title it has been universally, but very improperly known; for while the tree we have figured comes, as we have already stated, from the West Indies, the Wintera *aromatica*, whose existence remained in oblivion nearly a century, during which time the bark of the former was substituted for it, is found in the neighbourhood of the Antarctic regions, and belongs to a different class. An excellent plate of it is given in Vol. V. of Medical Observations and Inquiries, and to that work we are indebted for the subjoined botanical account by Dr. Solander; which it will be well to compare with the one already given of Canella *alba*.

"*The Winter's Bark-tree*, Winterana *aromatica*, is one of the largest forest trees upon Terra del Fuego; it often rises to the height of fifty feet. Its outward bark is, on the trunk, grey, and very little wrinkled, on the branches quite smooth and green.

"The *branches* do not spread horizontally, but bend upwards, and form an elegant head of an oval shape.

"The leaves come out, without order, of an oval elliptic shape, quite entire, obtuse, flat, smooth, shining, of a thick, leathery substance, evergreen, on the upper side of a lively deep green colour, and of a pale bluish colour underneath, without any nerves, and their veins scarcely visible; they are somewhat narrower near the footstalks, and there their margins are bent downwards.

"In general, the leaves are from three to four inches long, and between one and two broad; they have very short *footstalks*, seldom half an inch long, which are smooth, concave on the upper side, and convex underneath. From the scars of the old footstalks the branches are often tuberculated.

"The peduncles, or footstalks for the flowers, come out of the *axillæ foliorum*, near the extremity of the branches; they are flat, of a pale colour, twice or three times shorter than the leaves; now and then they support only one flower, but are oftener near the top divided into three short branches, each with one flower.

"The *bracteæ* are oblong, pointed, concave, entire, thick, whitish, and situated one at the basis of each peduncle.

" *Calyx*, or *flower-cup*, it has none; but in its place the flower is surrounded with a *spathaceous* gem, of a thick, leathery substance, green, but reddish on the side which has faced the sun: before this gem bursts, it is of a round form, and its size is that of a small pea. It bursts commonly so that one side is higher than the other, and the segments are pointed.

" The *corolla* consists always of seven petals, which are oval, obtuse, concave, erect, white, have small veins, and are of an unequal size, the largest scarcely four lines long; they very soon fade, and drop off almost as soon as the gem bursts.

" The filaments are from fifteen to thirty, and are placed on the flattened side of the receptacle; they are much shorter than the petals, and gradually decrease in length towards the sides.

" The *antheræ* are large, oval, longitudinally divided into two, or as if each were made up of two oblong *anthers*.

" The *germina* are from three to six, placed above the receptacle, turbinated, or of the shape of an inverted fig, flat on the inside, and somewhat higher than the stamina; they have no styles, but terminate in a stigma, which is divided into two or three small lobes.

" The fruit I have never seen in its perfect ripe state, but can conclude from the unripe ones, which I saw in abundance, that each germen becomes a separate seed-vessel, of a thick, fleshy substance, and unilocular: in each I could plainly discern the rudiments of three, four, or five seeds."

" The bark," says Dr. Fothergill,) " of the Winterania, or Winter's cinnamon, brought over by the Dolphin, in respect to figure, exactly resembles that which was delineated by Clusius. The pieces are about three or four inches square, of different degrees of thickness, from a quarter to three-quarters of an inch. It is of a dark brown cinnamon colour, an aromatic smell if rubbed, and of a pungent, hot, spicy taste, which is lasting on the palate, though imparted slowly. It has the name of Winter's cinnamon, from a faint resemblance in colour and flavour to that grateful aromatic, though differing from it greatly in every other respect. This bark is only brought to us from the Straights of Magellan, and is the produce of the tree above de-

scribed. Much celebrated as an antiscorbutic by the first discoverers, but unknown in the practice of physic, no quantity, except as a curiosity, having been brought to Europe till the return of the ships sent out on the expeditions to the South Seas."

Qualities and Chemical Properties.—Every part of the tree exhales a powerful aromatic odour, and when in blossom, perfumes the whole neighbourhood. The flowers, dried, and softened again in warm water, are said to diffuse an odour nearly approaching to that of musk. The leaves have a strong smell of laurel. The berries, after having been some time green, turn blue, and become at last of a glossy black colour, and have a faint aromatic taste and smell. They are, when ripe, as well as the fruits of several kinds of laurel, very agreeable to the white-bellied and bald-pate pigeons, (*Columba Jamaicensis* and *leucocephala,*) which feeding upon them, acquire that peculiar flavour, so much admired in the places where they are found.

Canella *alba* is brought to England in casks and cases: the principal part is in quills, which are of a whitish yellow; while the flat pieces, which are somewhat thicker, are of a rather darker colour. The odour is strongly aromatic; the taste aromatic also, more like the clove than the cinnamon, warm, pungent, and somewhat bitter. It gives out all its virtues to alcohol, but the infusion, though bitter, possesses little of its aromatic properties. "The infusion is not altered by galls; sulphate of iron, or zinc; muriate of mercury, or tartarized antimony; but nitrate of silver, and acetate of lead, render it milky, and throw down precipitates."* The essential oil is often scented with the oil of cloves, and sold for it.

The results of analysis are, that it affords resin, volatile oil, extractive and colouring matters, gum, amidon, albumen, the acetates of potash and lime, hydrochlorate of potash, and hydrochlorate of magnesia.—*Journ. de Pharm.* vii. 197.

Medical Properties and Uses.—On account of its aromatic flavour, Canella *alba* is employed to cover the taste of

* Thomson's Dispensatory.

several articles of the materia medica. Combined with aloes, it forms a popular remedy, well known by the name of *hiera picra*, and, added to the tincture and infusion of senna, it covers its nauseous taste, renders it much more grateful to the palate, prevents it from griping, and might be advantageously substituted for the cardamom seeds, which enter into the composition of the former. It appears to be more useful as a condiment than as a medicine, for "the bark, together with the fruit of the capsicum, were formerly common ingredients in the food and drink of the Caraibs, the ancient natives of the Antilles; and even at present it makes a necessary addition to the meagre pot of the negroes."* In Martinique the berries are made into a much esteemed liquor.

Dose.—From ten grains to thirty, or more.

Off. Prep.—Tinctura Gentianæ composita. *E.*
Vinum Aloes. *L. E.*
Pulvis Aloes cum Canella. *D.*

* Trans. Linnean Society, vol. i. p. 99.



Cytisus scoparius

LXVII

CYTISUS SCOPARIUS.

Common Broom.

Class XVII. DIADELPHIA.—*Order* IV. DECANDRIA.

Nat. Ord. PAPILIONACEÆ, *Lin.* LEGUMINOSÆ, *Juss.*
CICERINÆ LOTACEÆ. *Burn.*

GEN. CHAR. *Calyx* bilabiate, *vexillum* ovate, large, carina obtuse. *Filaments* all united into a tube at the base. *Legume* flat, many-seeded, glandless.

SPEC. CHAR. *Leaves* oblong, ternate, upper ones solitary. *Branches* angular, unarmed. *Flowers* axillary, peduncles short. *Legume* fringed.

Syn.—Genista, *Ger. Em.* 1311. *f.*; *Camer. Epit.* 950. *f.*; *Dod. Pempt.* 761.; *Fuchs. Hist.* 218. *f.*; *Trag. Hist.* 961. *f.*
Genista angulosa trifoliata, *Raii Hist.* 474.
Genista Scoparia, *Lob. Ic. v.* 2. 89. *f.*; *Hook. Scot.* 211.
Spartium, *n.* 354. *Hall. Hist. v.* 1. 154.
Spartium Scoparium, *Lin. Sp. Pl.* 996; *Willd. v.* 3. 933; *Fl. Brit.* 753; *Engl. Bot. v.* 19. *t.* 1339; *Curt. Lond. fasc.* 5. *t.* 52; *Woodv. t.* 89; *Fl. Dan. t.* 313.
Cytisus Scoparius, *Link.*

FOREIGN.—*Genet à balais*, Fr.; *Ginesta*, It.; *Esparto*, Span.; *Giesta*, Port.; *Pfriemenkraut*, Ger.

THIS is a large, indigenous shrub, growing plentifully on dry sandy heaths and waste places; flowering in May and June.

It is a bushy plant, from three to eight feet in height, with innumerable ascending, long, straight, angular, smooth, dark, evergreen twigs. The leaves are deciduous, sessile, scattered, petioled, and ternate; but the upper ones are generally simple; the leaflets are small, obovate, entire, and smooth, but silky when young. The flowers are papilionaceous, large, and showy, very numerous, axillary, solitary, or in pairs, on simple stalks, longer than the leaves, of a deep golden yellow, sometimes tinged with orange, and occasionally of a pale lemon-colour. The calyx is cup-shaped, bilabiate, reddish purple, having the upper lip with

two, the lower with three small teeth. The corolla consists of five petals; the standard inversely pear-shaped, and reflexed, very large; the wings ovate-oblong, connected with the filaments; the keel of two petals, lanceolate, oblong, attached to the filaments, and connected at the lower margin by soft hairs. The filaments are ten, all united into a single tube, and support oblong orange-coloured anthers. The germen is oblong, hairy; the style awl-shaped, curved, and the legume compressed, brown, oblong, ciliated, and containing about fifteen or sixteen small, compressed, shining seeds. The seeds are exalbuminous, and the cotyledons epigean.—Fig. (*a*) represents the calyx; (*b*) the germen and style; (*c*) the stamens forming a tube at the base; (*d*) the legume or pod.

The flower-buds, before expansion, are sometimes pickled as a substitute for capers. The branches when tender are mixed with hops for brewing, and in some places used as fodder. They are also capable of being manufactured into a coarse kind of cloth; and are made into besoms, and used as thatch in many parts of England. The old wood furnishes the cabinet-maker with a most beautiful material for veneering.

Qualities.—The leaves and tops have a disagreeable odour, and a nauseous bitter taste, imparted by infusion both to water and spirit. The tops and seeds are directed for medical use.

Medical Properties and Uses.—Broom tops have long been celebrated for their cathartic and diuretic powers, and have been successfully employed in dropsical cases. His Royal Highness the late Duke of York is reported to have taken the decoction with considerable benefit.

An ounce of the green tops may be boiled in a pint and a half of water down to a pint, and a teacupful of this decoction given every hour till it operates freely on the bowels; and the dose may be repeated every day, or every second day. The seeds and flowers are said to be emetic, but according to Woodville, "the evidence upon which this assertion rests is not wholly to be relied on, as the former, when roasted, have been recommended as a substitute for coffee, and the latter employed as a pickle." Sydenham recommends the ashes, and their utility has been confirmed by Monro, and others; but their whole power, no doubt, depends upon the subcarbonate of potash which they contain.

Off. Prep.—Extractum Cacuminum Genistæ. *D.*



Æsculus Hippocastanum.

ÆSCULUS HIPPOCASTANUM.

Common Horse-Chesnut.

Class VII. HEPTANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. TRIHILATÆ, *Lin.* ACERA, *Juss.*
HIPPOCASTANEÆ, *De Cand.* ACERINÆ. HIPOCASTANIAÆ, *Burn.*

GEN. CHAR. *Calyx* 1-leaved, 5-toothed, swelled out. *Corolla* four or five irregularly coloured petals inserted into the calyx. *Capsule* 2-3-celled, and echinate.

SPEC. CHAR. *Leaves* digitate, with seven obovate, acuminate leaflets. *Corolla* 5-petalled. *Stamens* seven.

Syn.—Castanea Equina, *Ger. Em.* 1442; *Park*, 1401; *Raii. Hist.* 1683.
Castanea folio multifido, *Bauh. Pin.* 419.
Hippocastanum, *n.* 1029; *Hall. Hist. v.* 1. 442; *Clus. Hist. p.* 7.
Æsculus Hippocastanum, *Lin. Sp. Pl.* 488; *Willd. v.* 2. 285; *Woodv.* 349; *Hort. Kew. v.* 2. 335.

FOREIGN.—*Marronier d'Inde*, Fr.; *Castagno d'India*, It.; *Castanheiro da India*, Port.; *Rosskastanienbaum*, Ger.; *Paardenkarstengeboom*, Dut.; *Hestekastagnetræ*, Dan.; *Hætkastagnier*, Swed.; *Konskoi kastan*, Russ.

THIS magnificent, and beautiful tree is a native of the north of Asia, but it has been cultivated in almost every part of Europe since its introduction by Clusius, about the middle of the sixteenth century. It is of rapid growth, and when, in May, it is covered with its digitate foliage, and large handsome spikes of white flowers, it constitutes one of the most striking ornaments of our parks and avenues.

The common horse-chesnut frequently rises to a great height; and from the lower part of the trunk sends off numerous spreading branches, covered with a rough brown bark; the wood is white and soft, but soon decays, and is of little value. The leaves are set on long foot-stalks; they are large and digitated, with seven leaflets, proceeding from a common centre, the middle one being the largest, and the lateral ones on each side

gradually decreasing in size; the leaflets are of a spatulate form, pointed, serrated, ribbed, and of a bright green colour. The flowers stand on short foot-stalks, and are disposed in large, conical, erect racemes, at the extremities of the branches. The calyx is of a pale green colour, monosepalous, bell-shaped, and divided at the margin into five blunt teeth: the corolla is composed of five petals, which are ovate, slightly waved at the edges, spreading and inserted into the calyx by narrow claws, of a white colour, and marked immediately above the claw, with a yellow, or reddish spot. The filaments are awl-shaped, about the length of the corolla, curved, and supporting reddish, oblong, double anthers; the germen is cylindrical, furnished with a short style, and pointed stigma. The fruit is a coriaceous, roundish, 3-celled, 3-valved capsule, armed externally with short spines, and usually containing two subglobular seeds. The seeds are exalbuminous, the embryo curved, inverted, with thick fleshy cotyledons, which are firmly coadunate. The plumule is large 2-leaved, and the radicle conical curved, and turned towards the hilum, which is very large.—Fig. (*a*) represents the calyx; (*b*) a back and front view of the stamens; (*c*) the germen and style.

The Spanish chesnut was well known to the ancients, and is several times referred to by Virgil, under the name of Castanea, but the *Æsculus* of the Romans was a kind of oak, and not the tree now under consideration, for it appears that the *horse-chesnut* was not introduced into Europe until about the year 1550; and Matthiolus, who gives a figure, seems to be the first who described it.* In the time of Clusius it was so scarce that but one tree existed in Vienna, which being too young to bear fruit, nuts were obtained from Constantinople in 1588,† after which, it was very generally propagated. In 1633 it was cultivated in England by Mr. John Tradescant, and is now so common as to be known to every one, as a favourite ornamental tree, which grows rapidly, blossoms early, and forms an excellent shade.

Parkinson says—"Our Christian world had first the know-

* Constantinopli primum ad me allatæ sunt.—*Matthiolus, Compendium de plantis omnibus. Ed. Venet.* p. 101.

† *Woodville.*

ledge of it from Constantinople." The same author places the *horse-chesnut* in his orchard, between the walnut and the mulberry, as a fruit tree. How little it was then known, common as it has since become, may be inferred from his saying, not only that "it is of greater and more pleasant aspect for its fair leaves, but also of as good use for the fruit, which is of a *sweet taste*, roasted, and eaten as the ordinary sort of chesnut."

Qualities and Chemical Properties.—The fruit consists almost entirely of fecula. The bark, which is inodorous, is bitter, astringent, and slightly aromatic. It yields its virtues both to water and proof spirit. The sulphates of iron, and zinc, throw down from the infusion, dark-coloured precipitates; while oxymuriate of mercury and superacetate of lead precipitate it white. Tartar emetic effects no change in it. Gelatin precipitates a small portion of tannin. A new vegetable principle, named *Esculine*, which is said to possess alkaline properties, has been discovered in Æsculus *Hippocastanum*, by M. Carzoneri, and on it, the febrifuge virtues of the bark are supposed to depend.

Economical Uses.—The wood, as we have already mentioned, is soft, and soon decays; excepting when made into pipes for conducting the water underground, when it is said to last for many years. Horses are known to eat the fruit greedily—hence the name; and it is asserted, that coughs and pulmonary affections in these animals have been much relieved by it. Sheep, goats, and deer, also fatten on it; but, prior to giving the nuts to the former, it has been considered necessary to macerate them in caustic alkali, to destroy their bitterness; afterwards to wash them in water, and boil them into a paste. Lime water is said to answer as well. A better plan, however, is to let them germinate, by which means, as in the process of malting barley, a considerable quantity of saccharine matter is formed. M. Raiment of Anjou, was in the habit of mixing them with the provender for his cows, and states, that the quantity of their milk was thereby increased. They have been employed in France, and Switzerland, for bleaching yarn, and are recommended as of extensive use in whitening flax, hemp, silk, and wool. They contain a saponaceous juice, that is obtained by grinding or

rasping them, after which they are mixed with hot, or running water, in the proportion of twenty nuts, to ten or twelve quarts of water. Wove caps and stockings have been milled in this preparation, and take the dye remarkably well; and successful trials have been made for fulling stuffs and cloths. Linen washed in this water assumes a pleasing blue colour, and the filaments of hemp, steeped in it some days, become easily separable. The sediment, after infusion, loses its bitter taste, and is then excellent food for fowls when mixed with bran. Deprived of their acrimony and bitter taste, the fruit might be converted into food proper for men in times of scarcity. In 1796, Lord Murray obtained a patent for extracting starch from the seeds. The bark yields a yellow dye.

Medical Properties and Uses.—The bark, which, for use, should be about three years old, was first recommended as a febrifuge by Zannichelli; and several continental physicians have subsequently written accounts of its efficacy in intermittent, and other fevers. The hyperbole, however, in which they dealt, some averring it to be superior to Cinchona, produced an effect which we suspect is not entirely deserved. We therefore strenuously recommend some of our Cambridgeshire, or Lincolnshire friends, to put it again to the test of repeated experiments, for the details published by the French pharmacologists are too circumstantial and favourable not to deserve disproof or confirmation.

The powder of horse-chesnut bark was one of the common ingredients that entered into the factitious Cinchonas, which, during the prolonged war, when the British navy shut the continental ports, were resorted to from necessity by the French physicians.

A strong decoction has been commended as a lotion in gangrene; and four grains applied to the nostrils at night, are said to act mildly in the morning, as an errhine.

Dose.—From half, to one drachm of the powder, every four hours. Of the *decoction*, made with an ounce and a half of the bark to a pint of water, about two ounces may be given three times a day.



Roccella tinctoria



Cetraria Islandica

LXIX

ROCCELLA TINCTORIA.

Dyer's Lichen, Dyeing Rock-moss, or Orchel.

Class XXIV. CRYPTOGAMIA.—*Order* IV. ALGÆ.

Nat. Ord. ALGÆ, *Lin.* LICHENES, *Hoffm.*
LICHENALES, CETRARINÆ, PARMELIACEÆ, *Burn.*

GEN. CHAR. *Apothecia* circular, lateral, and margined by the thallus. The disk open, and placed upon a carbonaceous stratum. *Frond* cartilaginous, and somewhat leathery; round or thread-shaped; at first erect, subsequently pendulous.

SPEC. CHAR. *Frond* cylindrical, solid, but little branched. *Apothecia* scattered, subinnate, with a dark convex disk and an evanescent margin.

Syn.—Coraloides corniculatum fasciculare tinctoreum, Fuci teretis facie, *Dillen. Musc.* 120. *t.* 17. *f.* 39.
Parmelia Roccella, *Achar. Meth. Lich.* 274.
Roccella tinctoria, *Acher. Lichenogr. Univ.* 439.
Lichen Roccella, *Lin. Sp. Pl.* 1622; Eng. *Bot. v.* 3. *t.* 211; *Dicks. Crypt. fasc.* 3. 19.

FOREIGN.—*Orchel, Orseille,* Fr.; *Oricello,* It.; *Orciglia,* Sp.

THE Lichens constitute an extensive natural group of plants, belonging to the class Cryptogamia, of the Linnean system; and are commonly known in this country by the popular names of *rock-mosses, tree-mosses,* and *timestains*. By the illustrious Linneus they were included in one great, and complicated genus, Lichen; but Dr. Erick Acharius, a learned botanist of Stockholm, has since divided the whole series into three distinct tribes, and forty-two genera: and subsequently, Borrer in this country, and Fries in Germany, have greatly extended our knowledge of these interesting vegetables. In the plants of this Order, there are no regular roots, many of the species being attached by small fibres issuing from the under surface of the frond, or fixed to their place of growth as if by

a sort of cement. They are equally destitute of stems, and also of leaves properly so called; the part most analogous to a leaf, and which constitutes the body of the plant, being generally a crustaceous expansion, usually denominated the *frond*, and by Acharius the *thallus*. The species are very numerous; and not a few of them have at different times been employed in domestic economy, in medicine, and the arts. In Lapland, the branched coralline Lichen, Cenomyce *rangiferina*, is highly important in rural economy, as affording fodder for the rein-deer. A few species only have been used as food by men, but several sorts are eaten by goats, and other animals. Of these perhaps the most important in a dietetic point of view is the Cetraria *Islandica*, to be noticed hereafter; and a species mentioned by Professor Pallas, as growing on the calcareous mountains of the great desert of Tartary, and described by Acharius under the name of Urceolaria *esculenta*. In Siberia, the lungwort lichen, Sticta *pulmonacea* is used in the making of ale, as a substitute for hops, and Parmelia *physodes*, Usnea *plicata*, and Ramalina *farinacea*, when eaten with salt, are used in some northern countries as food. Dr. Withering tells us, that the country people in some parts of England, make an infusion of Peltidea *apthosa*, in milk, and give it to children affected with thrush, and that in large doses it excites purging and vomiting. Nor is this tribe of plants when administered internally, entirely harmless, for according to Pontoppidan, the yellow filamentous lichen, Evernia *vulpina*, is so poisonous, that it is employed for killing wolves, a carcase of some animal stuffed and smeared with the powder of it, mixed with pounded glass, being set as a bait. Several species are used for dyeing, and not a few were at one time considered as of great efficacy in the practice of medicine. Thus the common *cup-moss lichen*, Lichen *pyxidatus*, or Cenomyce *pyxidata*, Ach. was long regarded as an infallible nostrum for the hooping-cough; the *common ground-liverwort*, L. *caninus*, or Peltidea *canina*, Ach., received its trivial name from the fame it had acquired as a specific in the cure of hydrophobia, and the *tree lungwort* or *oak-lungs*, was equally renowned in former times for the cure of pulmonary complaints. At the pre-

sent day, two species only, the Roccella *tinctoria* and Cetraria *Islandica*, the subjects of the following article, are retained in the list of the British Pharmacopœias.

The Orchel or Archil, Roccella *tinctoria*, is an indigenous Lichen, found sparingly on the maritime rocks of the south of England, particularly in Portland Island, and grows very abundantly on the sea rocks of the Cape Verd, and also of the Canary islands; and from both clusters it is exported in considerable quantities. In France it is called *Orseille*, and is used to a considerable extent in the southern provinces for dyeing silks, being collected on the rocky shores of the Mediterranean. By the Dutch, it is manufactured into a paste called by them *Lacmus*, or *Litmus*. This is sold in square masses about an inch in length, and half an inch in breadth, and thickness; hard and brittle, having the appearance of a violet coloured earth with white spots. The plant seldom exceeds two inches in height; it is firmly fixed to the rocks, and sends up a thick tuft of slender worm-like stems, round, pointed, often curved, more or less branched, smooth, of a white, grey, or brownish hue, studded about their upper part with numerous scarlet tubercles, or wart-like excrescences, replete with a white powder, which has been regarded by Hedwig, as pollen or seeds, and by Gærtner and others as a peculiar sort of gems or buds. The latter opinion has been established by Acharius, and lichens are now considered as gemmiparous plants, propagated only by bud-knots, or gongyli.

Although many other species afford colours, this is the most valuable lichen as a dye-stuff. If we may credit Tournefort, it was known to the ancients, being the Λειχην of Dioscorides, and the *Phycos thalassion* of Pliny. It was collected in the islands of the Archipelago, and from one of these acquired the name of *Purple of Amorgus*. In modern times, according to Berthollet, it was prepared as an article of commerce at Florence, the fine violet colour which resulted from mixing it with urine, having been accidentally observed by a Florentine merchant, about the year 1300, while visiting the Levant. The persons by whom the *archil* or *litmus* was formerly prepared, being desirous to keep it a

secret, gave it the name of *tincture of turnsole*, pretending that it was extracted from the turnsole, *Heliotropium Europæum*. Its nature is now well known in this country, and large manufactures of it are carried on in London and Liverpool. The Lichen is imported as it is gathered, and is prepared in the following manner :—The plant is first dried, cleansed, and pulverized in a mill like the oil-mill. The powder is then thrown into a trough, with one-half its weight of pearlash ; is moistened with a little human urine, and then allowed to ferment. This fermentation is kept up for some time by successive additions of urine, till the colour of the materials first changes to a purple red, and then to a blue. In this state it is mixed with a third of its weight of very good potash, and spread upon deep wooden trays till dry. A quantity of chalk is added at last, apparently for the mere purpose of increasing its weight. It may here be remarked, " that another species of Roccella, R. *fuciformis*, is reported to vie in richness of colouring matter with the common orchel, while the plant attains to a much larger size. This species, like the former, occurs sparingly on the sea rocks of the south of Europe ; but it is said to abound in the East Indies, especially on the shores of Sumatra, and might deserve the notice of some of our enterprising countrymen."

Prepared archil, which has a violet odour, derived from orris root, very readily gives out its colour to water, to volatile spirits and alcohol, and is the substance principally made use of for colouring the spirits of thermometers. As exposure to the air destroys its colour upon cloth, the exclusion of the air produces a like effect in hermetically sealed tubes, the spirits of large thermometers becoming in a few years colourless, and the colour being again restored by the admission of air. Archil stains marble in a beautiful manner ; and by the addition of a little solution of tin, this drug gives a durable dye of a scarlet colour.

Medical Properties and Uses.—We know of no medicinal virtues possessed by this lichen, though it was employed at one time for relieving pulmonary complaints. It is, however, used in the manufacture of red and blue syrups ; which in the trade are known as syrup of red poppies and syrup of violets.

Litmus is used in chemistry as a most delicate test, either by staining paper with it, or by infusing it in water; which will presently turn red by acids, and have the blue colour restored by an alkali.

CETRARIA ISLANDICA.

Iceland Lichen, or Eryngo-leaved Liverwort.
Pl. 69.

GEN. CHAR. *Apothecia* roundish, plano-concave, attached obliquely towards the apex of the thallus, or its lobed divisions, and therefore loose beneath, elevated and bent inward at the circumference; disk open, thin, and placed upon a cellular stratum. *Frond* membranaceous, foliaceous, irregularly laciniated, smooth below.

SPEC. CHAR. *Frond* cartilaginous, olive brown, bright reddish or pale at the base; lobes sub-erect, irregularly linear, multifid, channelled, fringed or toothed, the fertile ones dilated. *Apothecia* obliquely scutellate, of the same colour as the frond, with a raised entire border, and dark brown disk.

Syn.—Lichenoides rigidum, eryngii folia referens, *Raii Syn.* 77; *Dill. Musc.* 209, *t.* 28. *f.* 111.

Lichenoides Islandicum, *Hoffm. Plaut. Lich. t.* 9. *f.* 1.

Physicia Islandica, *Michaux Fl. Bor. Amer.* 2. p. 326.

Cetraria Islandica, *Achar. Meth. Lich.* 293.

Lichen Islandicum, *Pharm. Lond. Ed. Dub.*; *Lin. Sp. Pl.* 1611; *Achar. Prodr.* 170; *Eng. Bot. v. t.* 1330; *Jacq. Coll.* 4. *t.* 8. *f.* 1; *Fl. Dan. t.* 153; *Grev. Fl. Edin.* 340.

FOREIGN.—*Lichen d'Islande*, Fr.; *Lichene Islandico*, It.; *Lichen de Islanda*, Sp.; *Musco da Islanda*, Port.; *Isländisches Moos*, Ger.; *Yslandsch Mos*, Dut.; *Islands Moos*, Dan.; *Islandsmossa*, Swed.

THIS species of Lichen is a native of the mountainous heaths and woods in the alpine parts of Britain. The late Sir J. E. Smith gathered it on the Pentland Hills, near Edinburgh, on Ben Lomond, and in various parts of Scotland. It occurs on all the heaths and mountains of the north of Europe, and Dr. Holland

informs us that it grows abundantly on the lava on the western coast of Iceland, where the whole plant is more luxuriant than with us. Although this Lichen is more or less common in all arctic countries, no mention is made of it by Wahlenberg, in his interesting account of the physical distribution of vegetables in Lapland.*

The Iceland moss seldom exceeds three inches in height, and is erect and bushy. The fronds form loose elegant tufts; they are membranous, somewhat cartilaginous, channelled below, variously sinuated, and lobed; the lobes being irregularly divided, notched, and fringed at the margin with hairs. The surface of the whole vegetable is smooth, shining, of a rich chesnut brown colour, with a green tinge when wet, paler underneath. In such plants as grow in the shade the colour is a pale brownish green. The fructification, or shields, are dark chesnut, large, polished, flat, and growing close to the upper surface of the frond.

Qualities and Chemical Properties.—Cetraria *Islandica* is inodorous, mucilaginous, tough, and bitter. When dry it differs little in appearance from the recent plant. It yields all its medicinal virtues to boiling water; and infused in rectified spirits, affords, by evaporation, a very small quantity of resin.

Subjoined is an account of its analysis by Berzelius.

Syrup	3 6
Bi-tartrate of potass, with some tartrate and phosphate of lime	1 9
Bitter principle	3 0
Green wax	1 6
Gum	3 7
Extractive colouring matter	7 0
Starch	44 6
Starchy insoluble matter	36 6
	101 6

Economical Uses.—The esculent properties of the Iceland moss are well known in many districts on the continent of Europe. Of late years it has been proposed to use it, either alone, or mixed with flour, in the composition of bread in those districts where flour is scarce. The Saxon Government a few years ago published a

* Linneus' Lapland Tour, by Smith.

Report on this subject, which is full of information, and interesting in those mountainous districts where this plant abounds. In this report, we are informed, that 6 pounds and 22 *loths* of lichen meal, boiled with fourteen times its quantity of water, and baked in this state with $39\frac{1}{2}$ pounds of flour, produced $111\frac{1}{2}$ pounds of good household-bread. Without this addition, the flour would not have produced more than $78\frac{3}{4}$ pounds of bread, consequently, this addition of 6 pounds and 22 *loths* of lichen meal occasioned an increase of $32\frac{5}{6}$ of good bread. It is known that three pounds of flour yield four pounds of household bread. One pound of lichen meal, added in the form of paste, gives an addition of nearly 6 pounds, and therefore is equivalent in this view to about $3\frac{3}{4}$ pounds of flour, because it affords $3\frac{1}{2}$ times more bread than this. But at present, nearly all the Iceland moss collected in Germany, is sent through Hamburgh to this country, where it is used in brewing, and in the composition of ship-biscuit, which when Lichen meal is introduced is not attacked with worms, and suffers little from the action of sea-water.

Dr. Ebeling, in his thesis, recommends it first to be infused in boiling water, with a view to its being thoroughly cleansed; while, by the same means, it will be deprived of a considerable part of its original bitterness. The lichen, thus prepared, is to be boiled, and the mucilage so obtained from it, to be used either as an article of diet, or of medicine; and we have it in our power to render it exceedingly palatable by the addition of a little white wine, when that can be given with propriety; or, when wine is not admissible, by the addition either of milk, honey, or the syrup of lemons.

Medical Properties.—Iceland moss was first recommended by Linneus as a popular remedy in Sweden, for coughs. Scopoli afterwards published his observations on it, but it excited little attention in this country, till Dr. Regnault's treatise on consumption appeared, in which its virtues were highly extolled. According to Bergius, the lichen in its recent state is "eccoprotica," and when dried, "nutriens, pectoralis." In the Dispensatorium Fuldense, it is said to be "astringens, roborans, humectans, inviscans, nutriens, antiseptica." It is not, however, used on the Con-

tinent, indiscriminately, in every species of phthisis, nor in every stage of that disorder. It is chiefly recommended in those instances where the cough is attended with purulent expectoration; in cases preceded, or accompanied by hæmoptysis; in incipient phthisis, when from relaxation there is an increased discharge of mucus from the bronchiæ; in the sequelæ of measles, attended by a quick small pulse, pain of the breast, emaciation, violent cough, and purulent expectoration. The use of it is forbidden when vomicæ are already formed, and proceeding towards ulceration; in dyspnœa, and when there is an increased action of the vessels, with diminished expectoration. Neither has the use of Cetraria *Islandica* been confined to phthisical cases; it has been recommended in malignant fevers, dysentery, and hæmatemesis; as an enema in hæmorrhoids; and as an injection in gonorrhæa. In the recent state, it is boiled in milk, and frequently used by the peasants as a cathartic, and to expel worms. The most usual form of exhibiting this remedy on the continent is by boiling it in milk, or when milk disagrees with the stomach, in water. Scarcely any of the authors, however, who have published on it, appear to have trusted to it solely, but have generally united it with squills, opium, cinchona, and other active remedies. Iceland moss has owed much of its celebrity to the prevalence of the humoral pathology; for, as it consists of mucilage united with a bitter, it was supposed that the first principle would render it powerful in inviscating acrimony; and the second in gently constringing and corroborating the muscular fibres of the stomach. The decoction as ordered by our pharmacopœias, is so bitter as to prevent many persons from taking it; and when deprived of its disagreeable taste, it can only be viewed as a demulcent, and hardly equal in effects to linseed, quince seed, and marsh-mallows. Iceland moss certainly does not cure phthisis pulmonalis, but in the last stage of that disease, when solid food is oppressive, and the diarrhœa appears to be kept up by the acrid contents of the stomach and bowels; it has appeared to us to check the latter, and to impart both vigour and nourishment to the digestive organs.

Off Prep.—Decoctum Lichenis Island. L. E. D.



Colchicum autumnale.

COLCHICUM AUTUMNALE.

Common Meadow Saffron.

Class VI. HEXANDRIA.—*Order* III. TRIGYNIA.

Nat. Ord. SPATHACEÆ, *Lin.* JUNCI, *Juss.* COLCHICACEÆ, *De Cand.* MELANTHACEÆ, Brown, LILIALES, LILIACINÆ COLCHICACEÆ, *Burn.*

GEN. CHAR. *Perianth* single, corollaceous, with a radical tube and six-parted limb. *Capsules* 3, inflated. *Seeds* numerous.

SPEC. CHAR. *Leaves* flat, lanceolate, erect. Segments of the *perianth* oblong.

Syn.—Colchicum anglicum purpureum et album, *Ger. Em.* 157. *f.*
Colchicum commune, *Raii Syn.* 373; *Bauh. Pin.* 67.
Colchicum vere prodiens, *Camer. Epit.* 846. *f.*
Colchicum, *n.* 1255, *Hall. Hist. v.* 2. 124.
Colchicum autumnale, *Lin. Sp. Pl.* 485; *Willd. v.* 2. 273; *Fl. Brit.* 399; *Engl. Bot. v.* 2. *t.* 133; *Woodv. v. t.* 177; *Hook. Scot.* 114; *Stokes, v.* 2. 329.

FOREIGN.—Κολχικον, Diosc.; Εφημερον, Theophr.; *Colchique, Tu-chien,* Fr.; *Colchico autumnale, Giglio Matto, Strozzo-cane,* It.; *Zeitlose, Lichtblumo,* Ger.; *Tydeloosen, Naakte-vrouwen,* Dut.; *Nakna Jungfrur,* Swed.

MEADOW-SAFFRON, like the colts-foot, produces its leaves one season, and flowers at another; but differs in this respect, that the leaves, and fruit, appear early in the spring, and the flowers in the autumn. Hence it has been considered the harbinger of winter, and Linneus, in his Philosophia Botanica, observes, "*Colchicum autumni et gelu nuncia est.*" It is an indigenous perennial plant, found in several counties, chiefly in the west and north of England, where it grows in tolerable abundance, in moist, rich meadows. It occurs, among other places, at Filkins and Bradwell, Oxfordshire; in Weston Park, Staffordshire; at

Little Stonham and Bury, Suffolk; near Devizes, Wiltshire; about Derby and Northampton; and at the foot of the Malvern hills, in Worcestershire. Miller observed it, many years ago, in great plenty, in the meadows near Castle-Bromwich, in Warwickshire, in the beginning of September, and says, that the common people called the flowers *Naked Ladies*, because they come without the leaves. In Scotland it appears to be very rare; but Lightfoot, in his "Flora Scotica," mentions it as growing at Alloa.

The stem, which is called a solid bulb, consists of a fleshy succulent cormus, abounding in a milky juice, and covered with a brown membranous coat. This bulb, which is nearly as large as that of a tulip, and furnished at the base with numerous small fibrous roots, perishes after the ripening of the seeds, having first thrown out a lateral offset, that produces the flowers of the ensuing season. From this last arises, in autumn, along a furrow in the side of the old bulb, a long naked tube, which at the upper part expands into the flower. The leaves spring directly from the bulb in spring, along with the capsules. They are dark green, smooth, obtuse, spear-shaped, above a foot long, and pointed; growing erect. On the decay of the leaves, the flower makes its appearance, towards the latter end of September. It is large, of a pale purple or lilac colour, divided into six deep, elliptic-oblong, concave, upright segments, and rising immediately from the bulb, by a tube five or six inches long, two-thirds of which are sunk in the ground. The perianth is single, and the flowers are therefore often described as having no calyx. The filaments are awl-shaped, inserted into the tube of the corollaceous perianth, and support erect, oblong, versatile, yellow, extrorse anthers. The germen is roundish, and imbedded in the bulb. The styles are thread-shaped, the length of the stamens, and terminated by linear, recurved, and downy stigmas. The fruit is a capsule, with three lobes, closely connected; its dehiscence is loculicidal, and it contains numerous whitish, smooth, globular seeds, which are perfected in the month of June, when the capsule rises above ground on a short peduncle, accompanied by the leaves. The seeds are covered by membranous testæ, and inclose

a dense, fleshy albumen. A considerable variety obtains in this species, both with respect to the form and colour of the flower. In one variety the flowers accompany the leaves in spring. Fig. (*a*) represents a piece of the perianth with a stamen attached; (*b*) a style; (*c*) a stigma; (*d*) the germen, formed of three carpels, and crowned by three styles; (*e*) the capsule cut transversely to show its three cells, many seeds, and central placentæ.

In the introduction of Colchicum into modern practice, we are principally, if not wholly, indebted to Mr. Want. The first hint he obtained on this subject, was derived from the writings of Alexander of Tralles,* a Greek physician of the sixth century, whose book on gout is one of the most valuable clinical records of antiquity; and who, in his chapter on anodynes, remarks, that some persons take a medicine called *Hermodactylon*, which produces an evacuation of watery matter from the bowels, attended with such relief that patients are immediately able to walk. But, says he, it has this bad property, that it disposes them who take it to be more frequently attacked with the disease. He speaks, also, of its producing nausea and loathing of food; and proceeds to describe the manner of counteracting its bad properties. The effects here spoken of are so similar to those resulting from the exhibition of the Eau Medicinale, that Mr. Want was led to hope that it might be the same medicine, or, at least, that it possessed powers of the same kind; and on procuring a specimen of this plant from Constantinople, it was found to be the Colchicum. The Hermodactyl was strongly recommended by Paulus Ægineta as a specific for the gout, also by Pepagoneus, who wrote a treatise on that disease at the request of the Emperor Michael Palæologus, in the 13th century; and such was its reputation, that it obtained the name of *Anima Articulorum*, "the soul of joints." Two of the most celebrated gout-specifics, viz. Turner's Gout-powder, and the Vienna Decoction, the latter of which is so strongly recommended by Behrens in the *Ephemerides Naturæ Curiosum*, are formed

* Alexander Trallian, cap. xi.

principally of Colchicum; and it is notorious to every practitioner acquainted with the history of his profession, that this root has, at different epochs, obtained a celebrity in the treatment of gout, though its general use has, after a time, been suspended. But the extensive experience of the present day enables us to affirm, that the occasional want of confidence in its power has arisen less from its inefficiency than from its misapplication. The difference of opinion which has been expressed by many, after repeated trials of this bulb, only proves, that its efficacy is deteriorated by soil, or that it has been taken up at an improper period. Indeed so much does it vary in its effects, according to soil and season, that, according to Lee, the solid bulbs are eaten in Carniola, in autumn, without inconvenience. Turner recommends fifteen grains at a dose, with equal parts of other purgatives; while Störck* affirms, that less than a grain, wrapped up in crumbs, and taken internally, produce alarming symptoms. Trallian advises the addition of scammony, if a fuller evacuation of the bowels be necessary. Prosper Alpinus says, that Colchicum is perfectly inert, and that the Egyptian women fatten themselves with the wasted roots, often eating twenty in the course of the day, without having any effects produced, either on the stomach or bowels.† More modern experimentalists have differed nearly as much on the powers of Colchicum; but, owing to the investigations of Messrs. Battley and Thompson, the time at which the bulb should be taken up has been satisfactorily proved, by its uniform effects. In the spring, (*April*,) the root does not materially vary in size and general appearance from that which is ordinarily met with. It is then of full size, but irregularly indented or hollow. At this time it is found with a small attached bulb, about the size of a bean. The growth of this small bulb *proceeds* from the latter end of April

* We are afraid that little reliance can be placed in Störck's veracity; for De Haen, who was his contemporary, finding that his experience of the effects of hemlock did not support the assertions of the former, investigated the alleged fact of his curing 36 cases of cancer by it, and found that 30 of them had died victims to the disease, and that the rest remained uncured.—See his *Epistola de Cicuta*.

† De Medicina Ægyptiorum, lib. iii. cap. 16, p. 109.

or beginning of May, (according to the season,) until the latter end of June or beginning of July, at which time it attains its full growth. The parent root appears to yield as the new production advances, and when the latter attains its full size is no where to be found. The *new* root is then plump, firm, and without any indentation or hollow, and does not undergo any change of appearance from this period until the latter end of August, when in its turn it becomes *old*—for at this period it throws out a new bulb: from that new bulb the flower proceeds, and in the course of a very few days it is fully displayed. Between this latter period and the spring very little apparent change takes place: the root and offset are then found as first described. These changes are, of course, subject to some variation from soil, climate, and season. The state and condition of the root, if subjected to experiment, illustrate the process of nature in a striking and forcible manner. A transverse section of the bulb, exposed to the temperature of 170, if procured in *autumn*, contracts, and when dried is shrivelled; if procured in *spring*, the cuticle collapses, no other part of the then remaining substance being capable of enduring heat; if procured in the months of *July* and *August*, before the new bulb is projected, it remains quite solid and firm, and has a creamy appearance.

It may be inferred from these facts, that this root is deprived of its power progressively, from the time of throwing out the new bulb, until its final disappearance; and that, although very little change of appearance occurs during the winter months, it really undergoes a decided deterioration in that period.

Qualities and Chemical Properties—The root, when taken from the ground at the time recommended, and cut transversely, exhibits a milky appearance on both surfaces. The exudation is not particularly pungent: it rather impresses the tongue with a cold but peculiar sensation, which remains unabated for some time. This sensation is accompanied by a peculiar excitement, which is conveyed to the fauces, and continues still longer than the first-mentioned sensation of cold. The properties of Colchicum reside in this milky juice, and depend

upon an alkaline principle termed *veratrine*,* which has also been discovered in the seeds of the Veratrum *Sabadilla*, and the Veratrum *album*. When treating of the latter plant, we shall fully advert to its properties. It contains, also, gum, starch, inulin, and extractive matter, which, when in solution, undergoes a chemical change, supposed by Dr. Paris to be analogous to that which takes place in the infusion of senna. Sir E. Home ascertained, that this deposit in the vinous infusion excites nausea and griping, but that it may be removed without destroying the efficacy of the medicine. It is now generally believed, that Husson's *Eau Medicinale* owes its virtues to Colchicum; for not only does it correspond to our Vinum Colchici in its effects, but it is notorious that Wedelius, a continental physician, sold an empirical preparation of this plant, which was extolled as a panacea; while the catalogue of its virtues bears strong resemblance to Husson's original advertisement, and the account of this nostrum is contained in Geoffroy's system of Materia Medica, well known in France, where Husson lived. Wilson's and Reynold's specifics are also entirely indebted to Colchicum for any virtues that they may possess.

Good Colchicum, that is, Colchicum taken up in July, contains gluten; and, as Dr. Todd Thompson found, that those specimens in which this principle can be demonstrated are the most powerful in their effects, he infers, (what is now generally acknowledged,) that these only should be regarded as fit for medical use, and, therefore, that the agent by which gluten is detected in the dried bulb must be regarded as a proper test of its goodness. Dr. Thompson, therefore, rubs ten grains of Colchicum in a mortar, with sixteen minims of distilled vinegar, which is the best solvent of gluten, and immediately adds the same quantity of an alcoholic solution of guaiacum; a most beautiful cerulean blue is directly evolved:—"Distilled vinegar,

* It is very remarkable, that M. Jussieu, in his *Genera Plantarum*, fol. 53, should say laconically, when speaking of Colchicum, "Habitus Croci aut Gethyllidis, sed major cum Veratro affinitas."

when added alone to the alcoholic solution of guaiacum, merely precipitates the guaiacum unaltered; consequently, the change of colour is evolved, if the powder of Colchicum be well rubbed with the solution alone, although it is by no means so quickly produced."

Dr. Thompson further recommends, that the bulb, when taken up in July, should be cut as soon as possible into transverse slices, equal in thickness to half-a-crown, and then, being spread out upon clean white paper, should be dried without artificial heat, in an airy situation, screened from the sunshine.

Poisonous Effects.—About twelve months ago, two or three deaths occurred, through the prevalence of the mistaken idea that Colchicum produced a *specific* action on the uterus, whereby abortion might be ensured; when it is very evident, that such effects arise solely from the violent purging and inflammation which it is capable of exciting, in common with black hellebore, elaterium, and some other plants. The subjoined case has been kindly communicated to us by Mr. Dillon:—

"Susan Laing, about thirty years of age, and of good health and constitution, was about two months gone in pregnancy of a bastard child, and, having read in a newspaper, that a woman was taken up for causing abortion by taking meadow-saffron, she determined on getting rid of her burthen by a similar measure. She accordingly bought twopennyworth, and made an infusion of it, which she took on an empty stomach, early in the morning of the 10th of March, 1827. I was called to her about four o'clock in the afternoon of the 11th, and on inquiry, learned that she had miscarried the preceding evening. I found her in a very hopeless state; her extremities were quite cold, and the whole of her body, particularly the hands, feet, and face, livid; the glossy stare of impending death was in her eyes; the respiration was hurried, and the pulse could not be felt at the carotids, and but faintly at the heart. Notwithstanding, the sensorium was undisturbed, and she gave me a clear account of what she had done, her motives for so doing, and the effects the poison had on her. She said, that in about half an hour after she had taken it, her stomach became sick, gripes came on, and a violent purging, which continued with great severity. She had had no medical assistance, and had past a most wretched time from the morning before, and was so tormented with pain and purging, that she had not a wink of sleep in the course of the night. I administered to her large draughts of brandy and spices, but to no effect, as she died in two hours after I was called in. The body was opened the next day, and all the viscera were found perfectly sound, with the exception, that the mucous membrane of the stomach and bowels was dreadfully inflamed, throughout its course."

Garibel, in his "*Histoire des Plantes des environs d'Aix*," records,

that a servant was killed by taking the flowers for an intermittent fever; in which disease they were said to be useful. Cattle who feed in meadows, where Colchicum grows, are said to be affected in the spring by the seeds, which adhere to the coat of the stomach, producing at the several points of their adhesion, inflammation, which occasions death; and several pigs having eaten plentifully of the bulbs, which had been grubbed up, and placed in a yard, died in excruciating agonies; and on dissection, the stomach of each was found *burst*.

Treatment.—*See* Helleborus *niger*. Art. XI.

Medical Properties and Uses.—Colchicum is one of the most powerful remedies we are possessed of, in consequence of the direct action it is capable of exerting over the heart, and arteries. On the continent it has been chiefly used in the treatment of hydrotorax, and asthma, but although we have had considerable experience in its administration, we could never satisfy ourselves that its effects in those diseases were equal to squills; and as a diuretic it can never be relied on. If given in overdoses it produces distressing nausea, deadly vomiting, and profuse purging; but combined with some saline purgative which acts on the bowels *of itself*, the Colchicum even in large doses exerts its own specific powers, and in a few hours generally succeeds in destroying the paroxysm of gout. In acute and chronic rheumatism it is constantly given with the most happy results; and we have ascertained, that when digitalis fails to produce its effects, even in considerable doses, and after having been administered for some time, that by combining it with Colchicum our wishes will be speedily accomplished. The late Mr. Haden published an admirable little work on the power of Colchicum over inflammatory diseases; and a case of peritoneal inflammation which occurred in our own practice, and could only be mitigated by repeated bleedings, gave way immediately to the powdered Colchicum, conjoined with the sulphate of potash. The marked success of this case has led us to employ the same remedy in most inflammatory diseases, and having observed that the pulse was frequently rendered intermitting, we were led to its adoption in a case of hæmoptoe, where we had given drachm doses of digitalis without any decisive effects. We then gave half that quantity, combined with an equal part

of the Vinum colchici, and we were surprised to find that three doses brought down the pulse from 120 to 70 beats in the minute, attended by distinct intermissions. Since this case occurred, we have often prescribed these valuable agents conjointly, and have every reason to be satisfied with the results. Dr. Williams, of Ipswich, has adduced very satisfactory proofs of the mild and beneficial effects of a vinous tincture of the seed; and the flowers are also sometimes employed. In conclusion, we most earnestly recommend an attentive perusal of Mr. Haden's work, in which are recorded the beneficial effects of Colchicum in rheumatic and inflammatory fevers, inflammations of the lungs and membranes, catarrh, influenza, puerperal fever, and other affections, whereby bleeding was rendered unnecessary.

It is exceedingly desirable that such a powerful remedy should be prepared on an uniform plan, and as we fully agree with Dr. T. Thompson, that sherry wine is a much better solvent of the *veratria* than the dilute spirit, we avail ourselves of his form for making the wine of colchicum.

"Take of the bulbs of colchicum, (dug up in July,) sliced transversely, and dried without heat, or at a temperature not exceeding 110°, *one ounce and a half;* pulverise them, and pour upon the powder put into a glass-bottle, twelve ounces of good sherry wine. Agitate the mixture twice a day for seven days, and then filter for use."

For the same quantity of sherry, two ounces of the *seed*, or *flowers*, will be required, and of either of these tinctures, from thirty to eighty drops may be given, combined with carminatives, alkalies, or saline purgatives.

In some cases, particularly where acidity and flatulence prevail, the Spiritus seminum colchici ammoniatus (prepared by macerating for ten days, two ounces of the seeds in a fluid pint of the spiritus ammoniæ aromaticus) is said to be a medicine of greater value than the wine of colchicum.

The wine of colchicum has also been recommended in the cure of various other diseases besides gout and acute rheumatism. *Haden* boasts of its influence over the circulation being so great, hat it may be sometimes allowed to be a substitute for blood-letting. Thirty drops given three times a day are said to have

been effectual in the cure of hysteria, [Bibl. Med. lx. 124,] and three children are reported to have been cured of chorea in three or four days by its exhibition in doses of from ten to twenty drops. [Ib. lviii. 392.] Balber speaks favourably of Colchicum in the treatment of ophthalmia. And cough, from an irritable state of the mucous membrane of the air passages, is very much relieved by the administration of the extract of Colchicum, combined with small doses of blue pill and acetate of morpia. Dr. Elliotson recommends it in prurigo; and Banhim says it is useful in cleansing the head and other parts from vermin.

Chaumenton informs us that the Turks resort to the vinous liquor prepared from Colchicum as one means of producing that state of extatic drunkenness in which they are too prone to indulge.

Dose.—The dose of the powder is from three to eight grains.

Off. Prep.—Vinum Colchici. *L.*
Acetum Colchici. *L.*
Oxymel Colchici. *D.*
Syrupus Colchici Autumnalis. *E.*



Ruta graveolens

RUTA GRAVEOLENS.

Common Rue.

Class X. DECANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. MULTISILIQUÆ, *Lin.* RUTACEÆ, *Juss.*, *De Cand.*, &c.

GEN. CHAR. *Calyx* 5-parted. *Petals* five, concave. *Receptacle* surrounded by ten melliferous points. *Capsule* lobed.

SPEC. CHAR. *Leaves* supra-decompound; leaflets oblong; the terminal one obovate. *Petals* entire.

Syn.—Ruta hortensis et montana, *Ger. Em.* 1255.
Ruta hortensis major, *Park. Theatr.* 132.
Ruta hortensis latifolia, *Bauh. Pin.* 336.
Ruta *Matth. Valgr. v.* 2. 95.
Rura foliis duplicato-pinnatis, lobulis ovatis, *n.* 1003, *Hall. Hist. v.* 2.
Ruta graveolens, *Sp. Pl. Willd.* 2. 542; *Bull. Herb. t.* 85; *Woodv. v.* 2. 483.

FOREIGN.—*Rue, Rue des Jardins*, Fr.; *Ruta*, It.; *Ruda, Arruda*, Sp.; *Raute, Gartenraute*, Ger.; *Ruite*, Dut.; *Ruta, Vinruta*, Swed.; *Ruta*, Russ.

RUE is a hardy evergreen under-shrub, a native of the south of Europe, and has been cultivated in our gardens from time immemorial, where it flowers from June to September. In the days of popish superstition and ignorance, it was called the *Herb of Grace*, from the circumstance of small bunches of it having been used by the priests for sprinkling of holy water among the people. The stem is bushy, round, and branched, rising to the height of two or three feet, woody at the lower part, and covered with a rough, striated, grey bark; but the upper branches are smooth, and of a yellowish green colour. The leaves are alternate, stalked, doubly pinnate, slightly tomentose, smooth, dotted, and of a deep bluish glaucous hue; the leaflets obovate, sessile, decurrent, very obscurely crenate, or entire, and tapering at the base. The flowers are of a pale greenish-yellow colour, copious,

and produced in terminal corymbose panicles, the terminal ones only having the full number of each of the parts of fructification, while the rest are octandrous, and have the calyx 4-parted, and a 4-petaled corolla. The petals are nearly ovate, concave, spreading, fringed at the extremity, and attached by narrow claws. The stamens are ten, awl-shaped, the length of the corolla, bearing small yellow anthers. The germen is oval, punctured, with crucial furrows, and surmounted by a short awl-shaped style and simple stigma. The capsule is gibbous, 5-lobed, bursting elastically at the summit of each lobe, and containing numerous rough, angular, blackish seeds. Fig. (*a*) represents a petal; (*b*) a stamen; (*c*) the style; (*d*) the germen; (*e*) the capsule; (*f*) a seed. The irritability of the stamens in the rue is a physiological phenomenon of interest.

Rue is easily propagated by slips or cuttings in the spring; and like rosemary, lavender, hyssop, and other similar aromatics, it thrives best in poor dry soils.

Qualities.—Every part of the plant has a strong peculiar odour, and a pungent, bitterish, nauseous taste. The bruised leaves are extremely acrid, and excoriate the mouth and nostrils, if incautiously applied, as they often are, to counteract bad smells. Their specific virtues reside chiefly in an essential oil, which they yield on distillation with water.

Medical Uses.—Rue is a moderately active stimulant, and antispasmodic, and was much extolled by the ancients. Hippocrates commends it as a resolvent and diuretic, and attributes to it the power of resisting contagion and poisons. An infusion of the leaves was formerly in much repute, as an anthelmintic, and if taken in sufficient quantity it certainly proves noxious to intestinal worms. Boerhäave, speaking of rue, observes, that the greatest commendations he can bestow upon it fall short of its merits. "What medicine," says he, "can be more efficacious for promoting perspiration, for the cure of hysteric passion, and of epilepsies, and for expelling poison?" Externally it has been employed in fomentations to gangrenous ulcers; but it possesses no superiority over chamomile or wormwood for these purposes, and it is but seldom employed.

Dose.—The dose of the powdered leaves is from ℈i to ℈ij.



Krameria triandria.

KRAMERIA TRIANDRA.

Triandrous, or Peruvian Krameria.

Class VI. TETRANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. POLYGALEÆ, *Juss.*, *De Cand.*, &c.

GEN. CHAR. *Calyx* 4-sepaled. *Petals* 4; the two lateral sessile, the two longer ones unguiculate. *Berry* dry echinated, and containing one seed.

SPEC. CHAR. *Leaves* oblong-ovate, pointed. *Stamens* 3.

Syn.—Krameria triandra, *Ruiz. Fl. Peruv. tom. i. Icon.* 93. *Mem. Reg. Acad. Matrit. v. i. p.* 364.

FOREIGN.—*Ratanhie.* Fr.; *Ruiz para los dientes,* Sp ; *Ratanhia,* Huanuco ; *Mapato,* Tarma.

THIS species of Krameria, called by us Rhatany, and by the Spanish inhabitants Ratánhia, is the spontaneous growth of many provinces in Peru, delighting in a dry argillaceous or sandy soil, and growing on the declivities of the mountains, exposed to the intense heat of a vertical sun. It was first discovered by Don Hypolito Ruiz in 1780, in the provinces of Tarma, and Xanca; and subsequently by the same naturalist in the provinces of Huánuco, Huamalies, and Canta; it is also found in abundance in the vicinity of Lima, on the high-lands of Puelles, and other hilly districts. It flowers nearly throughout the year; but blossoms most luxuriantly in October and November. It is gathered in large quantities, and from it a beautiful extract is prepared, which, as well as the root, is imported into Portugal for improving the colour, astringency, and richness of red wine. From this use in the manufacturing of wine the Portuguese and Spanish merchants have kept its properties so concealed, that in this country the root was unknown, till the captain of a Peninsular ship mentioned these facts to Dr. Reece; which induced him to apply to some Spanish merchants for further information, who corroborated the account, with respect to a certain root being used as a colouring liquor, but were unacquainted with its name. One of them afterwards furnished Dr. Reece with a preparation, that in Portugal was known by the name of wine *colouring;* it proved to be a saturated infusion of the root in brandy; and the deep colour

and richness it communicates to port wine renders it an article of great and deserved value to the manufacturer. Some of this root, and extract, forming part of a Spanish cargo, taken by our cruisers, was afterward sold in London, and Dr. Reece was thereby enabled to enter upon an investigation of its nature and medicinal qualities; and in consequence of the facts which he established, it has become a favourite remedy, and is admitted into the list of our materia medica. Continental writers, however, on the contrary, impute the practice of colouring wine with Rhatany to the British manufacturers, and speak of its use in France and Spain merely as an hæmastatic.

The Krameria *triandra* is an under-shrub, with very long, much branched, spreading roots, of a blackish red colour externally, red internally, and having an intensely styptic, bitter taste. The stem is procumbent, round, and divided into numerous spreading branches, which when young are white and silky, but afterwards become naked below, and acquire a black colour. The leaves are scattered, sessile, oblong-ovate, pointed; entire, white and silky on both surfaces. The flowers are terminal, solitary, and placed on short foot-stalks. The calyx consists of four lake-coloured sepals, the inferior larger than the others, sericeous externally, but internally smooth and shining; the corolla is composed of four petals, the two lateral being sessile, and the two longer ones unguiculate. The stamens are three, fleshy, inserted between the germen and the superior leaflets of the nectary; the anthers urceolate, small, terminated with a pencil of very short hairs, and perforated with two holes at the apex. The germen is ovate, supporting a red awl-shaped style, and simple stigma. The berry or drupe is dry, globose, echinated on all sides with stiff reddish hairs. Fig. (*a*) represents the two upper and two lower leaves of the nectary; (*b*) the pistil and stamens; (*c*) the pistil; (*d*) the drupe divided transversely, and a seed.

The stamens being usually four in number and of unequal lengths, the genus is referred by Sprengel, in his edition of the Linnean System, to the class and order Didynamia Angiospermia.

Qualities and Chemical Properties.—The root, which is somewhat larger than a goose-quill, is of a ferruginous colour; and the cortical part, in which its sensible qualities predominate, is very

thick, and breaks short. The ligneous part is tough, and fibrous, and somewhat mucilaginous. On being slightly masticated, the root discovers a very grateful astringency, leaving a lasting impression on the palate; and is slightly aromatic and bitter. These qualities are imparted, as well as its colouring matter, both to cold and boiling water, and to proof spirit. The tincture made with brandy approaches very nearly to the flavour of port wine. Dr. Duncan, jun. says in his Dispensatory, that "the rhatany root does not contain a resinous matter, and that it is without bitterness;" but as these assertions are contrary to fact, we must suppose that Dr. Duncan never saw it. The foreign extract, which is a gum resin, is a very beautiful transparent article; and Dr. Reece informs us, that on mixing it with the foreign extract of bark, or any astringent extract, it loses its adhesive quality, and becomes "powdery," and at the same time loses its astringency. The extract made from a decoction or infusion of the root is "powdery," and not so astringent as the powdered root, although evaporated in vacuo, or in a water-bath. Dr. Duncan also asserts that the foreign extract is so similar to kino, that the difference cannot be discovered; now the former varies from the latter both in appearance and taste, being slightly bitter, and readily dissolving in the saliva in the mouth. Vogel says that Kino is charred on exposure to heat, without changing its form; whilst the foreign extract of rhatany previously melts and swells, and this it does when as dry as kino.

From a careful analysis it appears, 1stly, that the most efficacious part of rhatany is that which dissolves in considerable quantity in water and alcohol, and imparts to these menstrua a brown colour; 2ndly, that in prescribing a decoction, or the extract, the mineral acids should not be added; 3rdly, that the astringent principle possesses, in great part, the properties of tannin, and seems to be a modification of this immediate matter of vegetables; 4thly, that the dried root contains an astringent principle, which is a modification of tannin, gallic acid, gum, fecula and a ligneous matter; 5thly, that the ashes of rhatany contain pure lime, carbonate of lime, carbonate of magnesia, sulphate of lime, and silex; lastly, that in one hundred parts of the powder are found,

Modified tannin	40
Gum	1.5
Fecula	0.5
Woody matter	48
Gallic acid, a trace ; water and loss .	10
	100

M. Peschier, of Geneva, believed that he had discovered a peculiar acid in this plant, which he called the *krameric*, but his observations have not been confirmed.

Medical Properties and Uses.—Rhatany is a very valuable tonic medicine for indigestion, arising from direct debility; and for flaccid leucophlegmatic habits. The late Dr. Perceval, of Manchester, speaks highly of a solution of the foreign extract, dissolved in camphorated mixture, as a remedy in the advanced stages of typhus fever; and says that it possesses all the good qualities of port wine, and is exempt from its pernicious ingredient, alcohol. Sir Henry Halford informs us, that he is in the constant habit of prescribing it for fluor albus, with the most marked success; and for passive uterine and other hæmorrhages. It is also an excellent tonic to accompany the use of diuretics, cathartics, and absorbent stimulants in case of dropsy arising from debility: and when the different preparations of bark disagree with the stomach, it may be substituted for it with the most beneficial results. Rhatany when taken into the stomach tinges the fæces of a red colour, but it does not affect the urine. Administered in diabetes, it diminishes the quantity of urine; but the sweetness and its other morbid qualities remain unaltered. As in the case of other vegetable astringents, ipecacuanha and its preparations are incompatible with the infusion of Krameria..

Preparations.—The *extract*, which is made by inspissating the expressed juice of the root in the heat of the sun, (by the natives of South America,) possesses, in great perfection, the medicinal properties of the root, and may be taken, in the form of pills, to the extent of five or ten grains, twice a day.

Of the *powder* may be taken from ten to thirty grains.

COMPOUND TINCTURE OF RHATANY.

R.—Rad. Krameriæ Triandræ contus. .	ʒ iij
Cort. Aurantii . . .	ʒ ij.
Rad. Serpentariæ Virg. . . .	ʒ ss.
Croci Anglic.	ʒ i.
Sp. Vini Rectificat. . . .	lb. ij.

Macera per dies duodecim, et cola.

This *compound tincture* is much recommended by the physicians of the Continent, as a pleasant and efficacious stomachic; and our own experience teaches us, that two tea-spoonsful in a little water, taken three or four times a day, will prove an admirable remedy for indigestion, and its consequences—as flatulency, heart-burn, cramp in the stomach, nervous irritability, &c.

The *simple tincture* is made with three ounces of the root to a quart of *proof* spirit; and is much used by dentists, combined with equal parts of rosewater, as a lotion to astringe the gums, and correct any unpleasant fœtor of the mouth. Equal parts of powdered Rhatany-root, orris-powder, and areca-nut charcoal, form the best tooth-powder with which we are acquainted.

Pl. 73.



Pinus sylvestris.

PINUS SYLVESTRIS.

The Wild Pine, or Scotch Fir.

Class XXI. Monœcia.—*Order* VIII. Monadelphia.

Nat. Ord. Coniferæ, *Lin. Juss.* Pinales, Pinaceæ, *Burn.*

Gen. Char. *Male fl.* in a *catkin*, naked. *Calyx* 0. *Corolla* 0. *Stamens* numerous, on a common stalk. *Female fl.* in a *catkin*, of close, rigid, 2-lipped, 2-flowered, *scales*. *Seeds*, 2 to each scale, winged.

Subgenus *Pinus*. Scales of the cone clavate and angular. *Leaves* inclosed in scarious sheaths at the base.

Spec. Char. *Leaves* rigid, in pairs. Young *cones* stalked, recurved. *Stamens* with a very small crest.

Syn.—Pinus sylvestris, foliis brevibus glaucis, conis parvis albentibus, *Raii Syn.* 442; *Duham. Arb.* v. 2. 125. t. 30.

Pinus sylvestris vulgaris, *Bauh. Hist. v.* 1. 253. *f.*

Pinus sylvestris montana, *Camer. Epit.* 40. *f. Matth. Valgr. v.* 1. 89. *f.*

Pinus *n.* 1661. *Hall. Hist. v.* 2. 317.

Pinus sylvestris, *Lin. Sp. Pl.* 1418; *Willd. v.* 4. 494; *Fl. Brit.* 1031; *Eng. Bot. v.* 35. *t.* 2460.; *Hook. Scot.* 275; *Ait. Kew. ed.* 2. *v.* 5. *p.* 314.; *Woodv.* 570. *t.* 207; *Ger. Em.* 1356. *f.*; *Lambert Pin.* 1. *t.* 1.

Foreign.—*Pin, Pin Sauvage*, Fr.; *Pino*, It.; *Pino, Pino silvestre, Pino Balsam*, Sp.; *Pinheiro, Pinheiro Bravo*, Port.; *Kiefer, Kiene, Kienbaum*, Ger.; *Tall, Furu*, Swed.; *Furr, Fyrretræ*, Dan.; *Sosna*, Russ.; *Sanabar*, Arab.

This genus has been very variously extended and restrained, by Linneus, and even by Lambert it was made to include not only the true pines, but also the whole, or nearly the whole, of Richard's *Abietinæ*; and even when more restricted, it is still often allowed to comprehend both the *Abietes*, or firs, and the *Larices* or larches. As in most works on medicine, the whole are treated of as Pines, it has been thought better to let them here remain in one genus, although, at least two, if not three genera are combined; and to esteem the modern genera, which are not universally received, as subgeneric groups.

The Scotch Fir is the only native species of pine. It grows spontaneously on the dry stony mountains of Scotland, Norway,

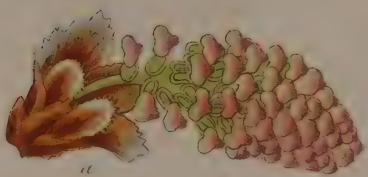
and other countries in the north of Europe; flowering in May, and ripening its seeds two years afterwards. It flourishes best in a cold climate, on a poor sandy soil, and lives to the age of four hundred years or more. The wood is known by the name of *red* deal,* and its value, as well as that of the tar, pitch, and turpentine, afforded by this species, are well known. The tree is planted on waste grounds and barren hills in several parts of our island as a shelter, or as a profitable object of culture, "though not one of the most agreeable ornaments to a country where any thing else will grow."

This tree, though lofty, seldom grows straight; the branches are numerous, oblique, and, like the stem, covered with a rough brown bark, which scales off in large thin flakes. The leaves, which surround the ends of the branches, stand in pairs, and are united at the base within a tubular, membranous sheath; they are equal, about two inches long, linear, narrow, somewhat pointed, minutely serrated, and evergreen; their upper surfaces are dark green, rather concave, originally clasped together, but soon separating: the under convex surface more glaucous and striated than the upper. The flowers are terminal, and erect; the *males* aggregated, spiked, sulphur-coloured, soon surmounted by a protruding leafy branch; each flower having several chaffy, concave, leafy *bracteas* at its base, which some have denominated a 4-leafed calyx; there is no corolla, although the spreading scales of the flower-bud have been regarded as such; the filaments are very numerous, collected below into a cylindrical column, and furnished with oblong, wedge-shaped anthers, of two cells, crowned with a jagged, membranous crest. The *female* flowers are collected to form an ovate, roundish catkin, variegated with green and purple, of numerous, imbricated, 2-flowered scales. There is neither calyx nor corolla. The germens are two at the base of each scale, and naked, without either style or stigma. The year after impregnation the young fruit becomes lateral, stalked, reflexed, and of a more ovate figure; and the second year ripens into an ovate, pointed, hard, tesselated, but unarmed woody cone, whose dry scales finally gape, and allow the dispersion of the winged seeds.—Fig. (*a*) represents the male catkin with its bracteæ; (*b*) the anthers; (*c*) the crest of the anthers; (*d*) the female catkin with its bracteæ; (*e*) a separate scale; (*f*) a ripe cone; (*g*) the same expanded by drought; (*h*) the seed with its wing.

* The *white* deal is from the Pinus *Abies*, or Abies *excelsa*, which, according to Mr. Coxe, is most demanded, because no country produces it in such quantities as Christiana and its vicinity.



















Pinus Pichtaica

PINUS, OR ABIES, BALSAMEA.

Balm of Gilead Fir.

SUBGEN. CHAR. *Scales* of the cone, slender and membranous. In the true *Abietes* the leaves are solitary.

GEN. CHAR. *Leaves* solitary, flat, imperfectly 2-ranked. *Cones* cylindrical, erect, with short-pointed scales. Crest of the *anthers* pointless.

Syn.—Abies balsamifera, *Mich. Boreal-Amer. v.* 2. 207; *Mich. Arb. For. v.* 1. 146. *t.* 14.
Abies taxi folio, odore Balsami Gileadensis, *Duhamel. Arb. v.* 1. 3. *n.* 3.
Pinus Balsamea, *Lin. Sp. Pl.* 1421; *Willd. n.* 27; *Ait. Kew. v.* 5. *p.* 319. *n.* 23.; *Lambert* 48. *t.* 31.
FOREIGN.—*Le Baumier de Gilead*, Fr.; *Die Balsamtanne*, Ger.

THE Balm of Gilead Fir has its natural abode in the northern provinces of America, but chiefly in Nova Scotia, Canada, New England, and the Alleghany mountains, in high cold situations; flowering in May, and ripening its seeds in September. It has long been cultivated for curiosity in England, but in general, though it attains to a considerable height, it does not thrive well, and scarcely survives above twenty years. Some of the largest trees of this species are said to be at Woburn, the seat of the Duke of Bedford, and at Warwick castle, the seat of the Earl of Warwick; but Mr. Lambert's specimens were procured at Longleat, Wiltshire, the seat of the Marquis of Bath, the only spot where he has seen this tree in perfection. Its fragrant exudation is the well-known Canadian balsam, which is often sold in the shops under the name of Balm of Gilead, but it is improperly so called; the latter, in its genuine state, is the produce exclusively of the Amyris *Gileadensis*, or Balsamodendron *Gileadense*.

This beautiful tree, which has very much the habit of the Silver Fir, (Pinus *Picea*,) rises with a tall erect stem. The bark is of a whitish grey colour, and in texture pretty smooth. The leaves are disposed on either side along the branches like the teeth of a comb, but in a double row, the upper one shorter than the other; they are linear, solitary, flat, broader than the former species, and less pointed; of a dark green colour, marked with a double glaucous line underneath, and numerous white dots. The *male* catkins are ovate: the crest of the anthers kidney-shaped, pointless, or furnished with short spines, but never bifid; the *females* with numerous ovate, notched, pointed bracteas. The cones stand erect on the branches, and when full grown are of a beautiful violet hue; great quantities of a transparent resin exudes from them, as represented in the plate; the trunk also when wounded yields a similar substance.—Fig. (*a*) male catkin; (*b*) anthers; (*c*) female catkin; (*d*) scales of the catkin; (*e*) its bracteolæ; (*f*) scale of the cone; (*g*) seed; (*h*) leaves.

This is one of the few firs that will patiently bear clipping, and hence it is well fitted for skreens and fences. In Canada, where it is common, its branches form the best bedding that travellers can get to sleep upon. The Indians, in their winter journeys, scrape the snow together with their shoes, thus making a kind of wall to their lair, and then strewing the ground with branches of this fir, wrap themselves in their blankets. Defended in this manner, they sleep in security, when the thermometer is many degrees below zero; and in this way did Captain Thompson sleep between two Indians in his unsuccessful attempt to overtake Captain Franklin in his arctic journey.



Pinus Abies.

PINUS ABIES, OR ABIES EXCELSA.

Norway Spruce Fir.

SPEC. CHAR. *Leaves* solitary, quadrangular. *Cones* cylindrical; their scales rhomboid, flattened, waved, and notched.

Syn.—Abies Picea, *Matth. Valgr. v.* 1. 88; *Camer. Epit.* 47; *Mill. Dict. n.* 2.
Abies foliis solitariis apice acuminatis, *Lin. Hort. Cliff.* 449; *Fl. Suec. ed.* 1. 789; *Fl. Lapp. ed.* 1. *n.* 347; *Dalib. Paris*, 295.
Pinus foliis solitariis, tetragonis, mucronatis, *n.* 1656. *Hall. Helv.*
Pinus Abies, *Lin. Sp. Pl.* 1421.; *Willd. v.* 4. *n.* 32; *Ait. Hort. Kew. ed.* 2. *v.* 5. *n.* 18; *Huds. Fl. Ang.* 424; *Scop. Carn. n.* 1194; *Fl. Dau. t.* 193; *Villars Dauph. v.* 3. 810; *Woodv.* 573. *t.* 208; *Lambert* 37. *t.* 35.

FOREIGN.—*La Pesse, Pece, Picea, Epicia, Le Faux Sapin, Le Sapin Rouge*, Fr.; *Picea, Zampino*, It.; *Picea, Pinabeto, Pinabete*, Sp.; *Peuce, Abeto Negro*, Port.; *Gran*, Dan. and Swed.; *Hartsboom*, Dut.; *Jel*, Russ.; *Xan mo*, Chin.

THE Norway Spruce Fir is one of the loftiest of the European trees, growing sometimes to the height of one hundred and fifty feet. It is a native of the mountains in various parts of Europe, as well as northern Asia, in places watered by alpine rills, where it attains a large size, and with its spreading branches and elegant pyramidal form, makes a magnificent appearance. In this country it has been long cultivated, not only as an ornamental tree, but also on account of the wood, which is one of the most valuable sorts of deal. The timber is chiefly imported from Norway; but Mr. Lambert informs us, that that which is grown in England is supposed to be the most

durable, and particularly esteemed for making ladders. The long sweeping fan-like branches, often broken down by loads of snow, or by the effect of boisterous winds, have a grand effect in alpine landscapes, and have been well employed in the sublime compositions of Salvator Rosa, and the German artists. Burgundy pitch, *Resina Abietis* of our modern pharmacopœias, is yielded by this species. It flowers in April.

The tree is usually straight, pyramidal, and covered with a reddish, scaly bark. The leaves are copiously scattered all round the branches, ascending, somewhat imbricated, each scarcely an inch long, on a short stalk, smooth, linear, curved, bluntish, with four rather unequal angles, shining on the upper surface, and of a dusky green colour. In summer, after a long continuance of dry weather, most of them decay and fall off. There are no sheath-like stipules. The flowers are terminal; the *male* catkins most plentiful; they are on short footstalks, erect, ovate, cylindrical, and of a tawny red; their bracteas numerous, spreading, longer than the common filament or basis of the stamens; the anthers yellow, their crest crimson, roundish, kidney-shaped, deeply and acutely jagged. The *female* catkins are sessile, oblong, erect, and of a rich crimson. The strobiles or cones are pendulous, solitary at the end of each branch, a span long, nearly cylindrical, of a purple colour, and sometimes green before they are ripe, smooth, of numerous imbricated, flattish, rigid, rhomboid scales, waved at the edges, and notched at the point. The seeds are small, rather flattened, and oval, with two thin elliptical-oblong wings.—Fig. (*a*) the anthers; (*b*) female catkin; (*c*) scale of the same; (*d*) seeds; (*e*) leaf.



Pinus Larix.

PINUS, OR ABIES LARIX.

LARIX EUROPEA.

Common, or White Larch-tree.

SPEC. CHAR. *Leaves* tufted, deciduous. *Cones* ovate-oblong; the margins of their scales reflexed, jagged. Scales of the *female* catkin fiddle-shaped, prominent in the full-grown cone.

Syn.—Larix; *Bauh. Pin.* 493; *Matth. Valgr. v.* 1. 95. *Ger. Em.* 1365; *Camer. Epit.* 45, 46.
Larix folio deciduo conifera, *n.* 1658. *Hall. Hist.*; *Duhamel Arb.* 1. 131. *f.*
Pinus Larix, *Lin. Sp. Pl.* 1420; *Willd. v.* 4. *n.* 24; *Woodv.* 576. *t.* 210; *Lambert*, 53. *t.* 35.

FOREIGN.—*Le méleze, melese,* Fr.; *Larice,* It.; *Larice, Alerce,* Sp.; *Larico,* Port.; *Lerketræ,* Dan.; *Listweniza,* Russ.

THE White Larch is a native of the Alps of Switzerland, Italy, Germany, and according to Miller, of Siberia. It has been long cultivated very extensively, and with great advantage, in this country; it flowers in March and April, before the leaves are fully expanded.

The Larch is a tree of quick growth, rising to the height of fifty feet or more, with wide spreading branches, whose extremities droop in the most graceful manner. They are adorned with numerous narrow, spreading, linear, bluntish, entire, soft, bright-green leaves, which spring in pencil-like tufts, from alternate, perennial cup-like, scaly buds. The leaves are deciduous, about an inch long, and have no other stipulas than the scales of the bud. From similar buds spring separately, on the same branch, the male and female flowers; the latter only accompanied by a few leaves. The bracteas to each flower are numerous, recurved, obtuse, with fine fringe-like teeth, chaffy, reddish-brown, and deciduous. The *male* flowers are in small lateral, cylindrical catkins, yellow, drooping, about an inch long, with the common filament much shorter than the bracteas; the anthers crowded,

deflexed, inflated, and two-lobed in front, with a short, recurved point. The *female* catkins are erect, ovate; twice as large as the male, beautifully variegated with green and pink; one lip of each scale is orbicular; the other much larger, fiddle-shaped, reflexed, with a prominent, awl-shaped green point. This lip becomes erect, enlarged, projecting always beyond the orbicular one, which dilates, hardens, and becomes the seed-bearing scale of the cone. The strobiles or cones are erect, rather above an inch long, ovate, obtuse at the apex, and purple, when young; and becoming of a reddish brown, when ripe. They have imbricated scales, which are spreading, orbicular, slightly reflexed, and jagged on the edges. In each scale are two-winged seeds.

The Larches are scarcely to be separated generically from the Abietes or Firs, as they agree in having their cone-scales rounded and membranous, and chiefly differ in the fasciculate arrangement of their leaves. The distinction is, however, serviceable, and a still further segregation has been attempted of the Cedars from the true Larches: the leaves of the latter being deciduous, while those of the former are evergreen.—Fig. (*a*) the stamineous catkin, natural size; (A) do. enlarged; (BB) front and side views of the polliniferous scales; (*c*) pistilliferous catkin, natural size; (C) do. enlarged; (*d e*) front and side views of the scales separated; (D E) do. enlarged; (*f*) naked seeds with their wings; (*g*) scales of the cone; (*h*) a leaf.

Pinus Sylvestris.

Most species of Pinus, says Dr. Maton,* may be made to yield (and many of them produce spontaneously) a resinous juice, usually called *turpentine*. This appellation more properly belongs to the product of a different genus, called by Linneus, Pistachia† of the ancients, which contains the true *Terebinthus*.

* Appended to Mr. Lambert's splendid work on the Genus *Pinus*, is an elaborate account of the various substances yielded by these trees; which was written by Dr. Maton: and as he has monopolized all the raw materials, and worked them up most admirably, we gladly avail ourselves of his labours.

† The Τερμινθος of Theophrastus, (lib. iii. c. 3,) and Dioscorides, (lib. i. cap. 76,) from which the word Terebinthus seems to have been derived. Pistachia *Tere-*

The juice of Pines, however, like that of the Turpentine trees, has an austere, astringent taste, singular viscosity and transparency, ready inflammability, and a disposition to become more or less concrete. In distillation with water it yields a highly penetrating, essential oil, and the liquor is found to be impregnated with an acid; a bitter, resinous substance remaining behind. The resinous *residua* of the several processes to which the matter extracted from Pines may be subjected, constitute the varieties of *rosin*, *colophony*, &c. There are, also, other products, both native and artificial, much employed in medicine and the arts. The terms commonly attached to these substances are, in general, extremely vague, ambiguous, and inexpressive. Those employed in ancient authors are not to be excepted from the application of this remark; they have occasioned great difference of opinion among commentators, and, in some instances, they remain to this day undefined: but, on the whole, they were used with more precision, perhaps, than is observable in popular discourse, or in the regular *pharmacopœias* of modern times.

Common Turpentine (*Resina liquida pinea*) is the produce of the Scotch fir; it is more coarse and dense than any other sort; and has an opaque, light brown colour. Its consistence is that of honey. The taste very acrid, hot, and disagreeable; and the smell much less pleasant than either the Venice or the Strasburg turpentines.

The artificial extraction of the resinous juice of the Pine was practised by the ancients, in a manner very similar to that which obtains at present. Theophrastus (lib. ix. cap. 2,) gives a particular account of the several trees employed for this purpose in his time, of the proper season of the year for commencing the process, and of the several variations in the qualities of the juice; and though commentators have not been able to refer all

binthus yields the resinous juice called in the shops *Cyprus* and *Chio* turpentine, the superiority of which to all the products of the Pine tribe, was well known to, and described by, most of the ancient writers on the Materia Medica. Genuine turpentine is almost colourless, and emits a peculiar odour, much more agreeable than that of the common turpentines of the shops.

the trees, described by this author, to their proper places in the Linnean *Species Plantarum*, it is evident, that three or four kinds of turpentine were in use amongst the ancient physicians, which correspond in their properties with those found in the shops of the moderns.

It has been remarked, that trees with the thickest bark, and which are most exposed to the sun, generally yield the most turpentine. After the outer bark has been taken away, the inner bark, and a thin slip of wood, are cut off, with a very sharp tool, so that there may be a wound in the tree not more than three inches square by an inch deep. The first incision is made near the foot of the tree; and as the resin flows most abundantly in hot weather, the operations are begun near the end of May, and continued to September. The resinous juice is received by holes dug in the ground at the foot of the tree, and is afterwards taken out with ladles made either of wood or iron; then poured into pails, in order to be removed to the hollow trunk of a pine sufficiently large to hold three or four barrels.

In France, distinct appellations have been given to the several states of the resinous juice of Pines; that which condenses on the wounds, towards the decline of the sap, being called *Galipot* in Provence, and *Barras* in Guienne; the fluid resin obtains the name of *Perinne vierge;* and a thinner kind of the latter, subjected to a sort of filtration, is called Bijon, or *Terebinthine fine.* The galipot is used by the chandlers to make flambeaux, though the greatest quantity usually undergoes conversion, by being boiled, in *brai-sec* and *yellow-resin.*

The liquid resin of the Pine, though of inferior quality to that of the Turpentine-tree, the Larch, and the silver Fir, especially for internal use, is too often substituted for the others by druggists. In most terebinthinate preparations, this species is the subject, and there is no reason, perhaps, why the essential oil, and other parts of it, separately taken, should not be equally good.

Essential Oil (*Oleum Terebinthinæ. Spiritus Terebinthinæ. Esprit de Rase. Essential Oil of Turpentine*) is obtained, as directed by the London Pharmacopœia, by distilling five

pounds of the resinous juice with four pails of water, in a copper alembic. If one pound of the oil be re-distilled with four pints of water, the result is called rectified oil of turpentine. (*Oleum Terebinthinæ rectificatum* of the London and Dublin colleges.) The process is not unattended with danger, for unless the luting be very close, some of the vapour is apt to escape; and if the latter should take fire, the vessels will burst. In some dispensatories, this rectified oil is denominated *ætherial.* It does not differ very considerably in specific gravity, smell, taste, or medical qualities, from the common essential oil.

Common Resin (*Resina flava*) is the residuum of the process for obtaining the essential oil. This process, pushed as far as the nature of the subject will admit of, changes the colour to a deep brown, or black, when the resin acquires the name of *black resin*, or *colophony*, which latter was originally the appellation of a raw, liquid resin, brought from Colophon, in Ionia, which is described by Dioscorides, (Lib. I. c. 77.)* The medicinal properties of these two resins are, of course, extremely alike. They are rarely used internally; but for external purposes they can scarcely be dispensed with, being remarkably adhesive when mixed with other materials. Colophony is of considerable use in the arts. It enters into the composition of several varnishes, and is sometimes substituted for sandarach. Musicians rub the bows and strings of violins with it, to take off greasy particles, and to counteract humidity.

Tar. (*Pix liquida Pinea.* Πιττα, Πισσα υγρα, Κωνος, of the Greeks. *Pix liquida* of the Romans, and of most modern pharmacopœias. *Goudron*, of the French.) This well-known substance is obtained from the roots and other parts of old pines, by a sort of *distillatio per descensum.* "Pix nihil aliud est (says Pliny†) quam combustæ resinæ fluxus." It differs from the native resinous juice in having acquired an empyreumatic

* See also Galen (*de Comp. Med.* lib. 7,) and Pliny, (lib. 14, c. 20.) Celsus allows the choice, either of the *Resina Colophonia*, or the *Resina Pinea*, in the composition of his discutient plaster: and Scribonius mentions Colophony as a purgative.

† Lib. 23. cap. 1.

quality from the action of fire; and in containing the saline and mucilaginous parts of the tree, mixed with the extractive, and the oily. The greater part of the tar imported into this country is brought from the Baltic, as the produce of the Scotch fir; but in America it is chiefly obtained from the Pinus *australis*. The process employed in most countries differs little from that which was followed by the ancient Macedonians, and which is circumstantially described by Theophrastus, in the third chapter of his ninth book, when he tells us, that the billets were placed erect beside one another, and that they were afterwards covered with turf to prevent the flame from bursting forth, in which case the tar was lost. The stacks were sometimes, he says, one hundred and eighty cubits in circumference, and sixty, or even one hundred in height. These huge heaps of wood being set on fire, the tar was made to flow from them in channels cut for that purpose. As all the trees of this genus yield the same substance, by the same treatment, it is probable that the ancients did not confine themselves to one species for obtaining it, any more than the moderns, and that some variety was occasioned in the product according to the different management of the fire, and in the cooling. Hence arise the confusion, and the difference of opinion respecting the terms *Cedra*, *Cedrælon*, *Pissæleon*, &c. which, after the most industrious collation of passages from Theophrastus, Dioscorides, Galen, and Pliny, it is scarcely possible at this day to refer to the precise substances which they were intended to designate. For the modern method of procuring tar, as practiced in the Valais, we must refer to Duhamel's *Traite des Arbres*, tom. ii. p. 160.

The substances mentioned above are officinal; but as the produce of the P. *sylvestris*, we have also:

1st. Pitch. (*Pix Pinea inspissata.* Βοσκας, of the Greeks. *Spissa Pix*, Pliny. *Brai-gras*, of the French.) Pitch is made by melting coarse, hard resin, (or *brai-sec*, as it is called in France,) with an equal quantity of tar, in large copper vessels similar to those used for boiling the raw juice. If the tar be too thin, the proportion of the resin is increased; and, on the other hand, if it be thick, a third part of tar is sufficient.

Should the process of inspissation be carried to its utmost limit, the pitch becomes hard and dry, and is called in the shops *Pix arida*, (the Πισσα ζηρα, and Παλιμπισσα of the Greek writers,) which is less pungent and less bitter than the common tar, and is used only in some external applications, as an adhesive substance, agreeing in its medicinal virtues with common digestives. Pitch is used extensively in ship-building; and, blended with oil and suet, is much employed by the sons of Crispin for waxing their thread. With whale oil it forms the grease for carriage wheels, and in several kinds of luting is familiar to mechanics, and handicraftmen.

2ndly. Lamp Black. (*Fuligo Pinea; Noir de fumee*, of the French.) To obtain lamp-black, a sort of box is made nicely closed in every part, with the exception of some holes in the top, which are covered with a sort of linen cone. At a little distance from the box a furnace is constructed, with a very small mouth, and the inferior part communicating with the inside of the box by an horizontal chimney. Into this furnace are put the dregs and coarser parts left in the preparation of tar; and in proportion to the consumption of these a supply is kept up, so as to furnish a constant draught of smoke into the box. The smoke goes chiefly into the cone, when it deposits its soot, or lamp-black, which is employed almost exclusively in printing and dyeing.

3rdly. Bark Bread. We are informed by Linneus, that the Laplanders eat, during a great part of the winter, and sometimes even during the whole year, a preparation of the inner bark of the pine, which they call *Bark-broed*. This substance is made in the following manner, viz. after a selection of the tallest and least ramose trees, (for the dwarf branching ones contain too much resinous juice,) the dry, scaly, external bark is carefully taken off, and the soft, white, fibrous, and succulent matter collected and dried. The time of the year chosen for this process is when the *alburnum* is soft, and spontaneously separates from the wood by very gentle pulling, otherwise too much labour would be required. When the natives are about to convert it to use, it is slowly baked on the coals, and being thus

rendered porous and hard, is ground into powder, which is kneaded with water into cakes and baked in an oven. The Siberian ermine-hunters, when their ferment or yeast, which they carry with them to make their *Quass*, is spoiled by the cold, digest the inner bark of the pine with water over the fire during an hour, mix it with their rye-meal, bury the dough in the snow, and after twelve hours, find the ferment ready prepared on the subsiding fæces.*

Pinus Balsamea.

Canada Balsam is the produce of this tree. (*Resina liquida balsamea. Balsamum Canadense*, Pharm. L. et. E. *Baumier du Canada* vel *Sapin Baumier*, Pharm. F.)

It is transparent, whitish juice, brought to this country from Canada; and differs little in its qualities from the celebrated Balm of Gilead, the product of *Amyris Gileadensis*, so high in esteem among the eastern nations, and so strongly recommended in a variety of complaints. Hitherto, however, it has not been much employed in England, yet it is thought capable of answering all the purposes for which the Copaiba balsam is employed; and would, therefore, deserve a more general trial. It has an agreeable odour, and a strong pungent taste.

Pinus Abies.

This tree yields the Thus† of the old London Pharmacopœia. (*Resina concreta abiegna. Poix*, of the French.) It exudes spontaneously from the pores of the tree, and soon concretes into distinct drops, or tears, which differ from Strasburg turpen-

* Pallas. Fl. Russ. p. 2. 3.

† The *Thus* of the ancients does not appear to have been the product of any species of *Pinus*, but as we are informed by Dioscorides, (lib. i. cap. 70.) pine resin was often substituted for it; and the substance now bearing that name in the shops, is seldom any other than the concrete resin described above. Dioscorides describes a mode of distinguishing the two kinds. "Resin," (of the pine,) says he, "when thrown into the fire, dissipate itself into smoke, whereas frankincense burns with a brisk flame, and the odour of the latter serves to detect imposition. "Some writers," observes Dr. Maton, "are of of opinion, that the genuine Λιβανος, *Thus*, or Frankincense, is obtained from Juniperus *Lycia*, and constitutes the *Olibanum* of our shops, but I cannot find any passages in ancient authors, sufficiently precise to corroborate this conjecture."

tine, the produce of the silver fir, Pinus *Picea*, in being compact, opaque, and of a deeper yellow colour. The common frankincense of the shops, is probably no other than this resin, or, at least, the latter is, in general, mixed with the former, and becomes an ingredient in the *Emplastrum Thuris compositum*, and *Empl. Ladani compositum*, of the London Pharmacopœia.

Burgundy pitch, (*Resina abiegna cocta. Pix Burgundica. Poix-grasse* vel *Poix de Bourgogne.*) This substance is of a close consistence, but rather soft, of a reddish brown colour, and not unpleasant smell. The shops are supplied with it chiefly from Saxony, where, however, many adulterations take place; and in this country, a preparation of the common turpentine substituted for it. Genuine Burgundy pitch, is prepared from the resinous juice of the Norway spruce, which is yielded by that tree from the month of April to September, from incisions made in the bark. In the operation of cutting, the wood is left untouched, for the juice exudes chiefly from *between* the bark and the wood, and in small quantities from the former alone; but not from the latter. It fixes almost immediately after it is freed from its lodgment, and therefore does not flow to the ground, but remains attached to the tree in large tears, or flakes. This concrete matter is collected once a fortnight, by detaching it with an instrument formed on one side like an axe, and on the other like a gorget. With this instrument, also, the incision is renewed every time that the resin is collected. A vigorous tree, planted in a good soil, will yield in one year thirty or forty pounds of juice; which becomes dry enough to be put into sacks, and is thus conveyed by the peasants to places where the following process is carried on, viz.—The resinous substance is put with a proper quantity of water into large boilers; a moderate fire melts it; it is then strained under a press, through strong, close cloths, into barrels, to be transported to distant countries. This is the method, according to Duhamel, that is practised in the neighbourhood of Neufchatel; but it differs in other places, as may be seen by consulting Axtius' *Tract. de Arb. Conif.*, p. 79; or Geoffroy's *Mat. Med.*, T. 3, p. 437.

Venice Turpentine, (*Resina liquida Larigna. Largatum*, of the Italians. *Terebintha Veneta*, Pharm. Ed.) a produce of this species of pine, is generally esteemed the best of the juices called Turpentines, after that of *Pistachia Terebinthus*. It is usually thinner than any other sort, of a pale yellowish colour, and of a hot, pungent, bitterish taste. It is said to remain always, or at least a very long time, in a state of liquidity; if it should at length become at all concrete, it is only on the edges, or sides of the vessel in which it may be contained. This property is adverted to by Pliny, *Lib.* 16. c. 10.

Though it bears the name of Venice Turpentine, very little is exported from the Venetian territory; but it is probable that the merchants of that country were the first who substituted it for the genuine turpentine of Cyprus. That which is most commonly met with in the shops, comes from New England; but the true liquid resin of the Larch is obtained chiefly from France and Germany. It is procured by boring holes in the trees in May, which are about an inch in diameter, and have a gentle inclination downwards: to these holes a kind of gutter is adapted, from fifteen to twenty inches in length, which terminates like a peg perforated in the centre. The juice passing along these tubes, falls into troughs, placed at their most depending part. This process is continued to the end of September; and as it is impossible to secure the troughs from leaves, and other extraneous matter, the resin is usually strained through a hair sieve into other vessels, in which it is transported to the places of sale.

Besides Venice Turpentine, the Larch also yields the *Orenburg Gum*, of the Russian shops; and, although it is used by no other country, it is described as a good substitute for Gum Arabic. It is very glutinous, rather dry, of a reddish colour, and a sub-resinous taste; but wholly soluble in water. The mode in which this substance is obtained is very remarkable. It sometimes happens that whole forests of Larch, in some parts of the Russian empire, are accidentally consumed by fire. During the

combustion of the medullary part of the trunks, a gum issues forth, which is diligently collected by the natives, for the purpose, not only of rendering their bows glutinous, but also of being eaten as a delicacy. It is also supposed to act as an anti-scorbutic, and a useful astringent for the gums.

Manna of the Larch (*Manna Larigna. Manne de Briançon.*) About the month of June, when the sap of the Larch is most luxuriant, it produces small white drops, of a sweet, glutinous matter, like Calabrian manna. This manna is collected by the peasants, who go very early in the morning to the forests, before the sun dissipates it, and lop off, with hatchets, the branches that bear it; carrying them afterwards to the shade, where they can collect the grains at their leisure. The Venetians have many different names for the varieties of it; and in Dauphiny it has been very generally employed as a laxative; but it is said to possess not more than half the strength of that which is yielded by the Calabrian ash.

Qualities and Chemical Properties.—It is, at present, the opinion of chemists, that *resins* stand in the same relation to the *volatile* oils that wax does to the *fixed*. Wax is considered as a fixed oil saturated with oxygen; resins, as volatile oils, saturated with the same principle. The reader can be at no loss to form a notion of what is meant by *resin*, when he is informed that common *rosin* furnishes a very perfect example of resin, and that it is from this substance that the whole genus derived their name: for *rosin* is frequently denominated resin: which is the substance that remains in the retort after the volatile oil (spirits of turpentine) has passed over. During the operation of distillation, succinic acid also rises. Turpentine may, therefore, be said to consist of *essential oil*, *succinic acid*, and resin, in the simple acceptation of the term.

Terebinthinous exudations, prior to the separation of the essential oil, are termed *resins;* they are solid substances, naturally brittle; have a certain degree of transparency, and a colour most commonly inclining to yellow. Their taste is more or less acrid, and not unlike that of volatile oils; but they have

no smell unless they happen to contain some foreign body. They are all heavier than water. All are *non-conductors* of electricity; and when excited by friction, their electricity is negative. Their specific gravity varies considerably. When exposed to heat they melt; and if the heat be increased, they take fire, and burn with a strong, yellow flame, emitting, at the same time, a vast quantity of smoke. They are insoluble in water, whether cold or hot; but under some circumstances are capable of uniting with a small portion of that fluid. All, with a few exceptions, are soluble in alcohol. Several are so in fluid oils, especially in the drying oils. The greater number are soluble in the volatile oils. Mr. Hatchett has ascertained, contrary to the received opinions, that alkaline leys dissolve them with facility. These alkaline solutions of resins have the properties of soap, and may be employed as detergents. Most of the acids dissolve resins with facility, producing different phenomena, according to circumstances; and the sulphuric and nitric convert them into artificial tannin.

When *volatile oils* are exposed for some time to the action of the amosphere, they acquire consistency, and assume the properties of resins. During this change, they absorb oxygen from the air. When volatile oil is exposed to the air, it is partly converted into a resin, and partly into a crystallized acid; usually the benzoic, or the camphoric. For a more complete account of these phenomena, we refer to Thomson's System of Chemistry; to which we are much indebted for this detail.

Medical Properties and Uses.—The writings of Dioscorides, Pliny, and Aretæus, prove that the ancients admitted all the varieties of the turpentines into their materia medica. The first-named author, in his second book, classifies them as moist and dry. Pliny adopts the same arrangement; and both enumerate, very fully, the different species from which each variety is obtained. "Summæ species duæ, sicca et liquida. Sicca é pinu et picea: liquida è terebintho, larice, lentisco, cupresso."* This enumeration accords very nearly with that

* Plinii Historia, cap. xxiv. sect. vi.

given by Dioscorides; as do his remarks on the method of employing them, both internally, and externally. Aretæus gave turpentine internally, in the form of a linctus, composed of nitre, rue, and honey, for lethargy, apoplexy, melancholia, and pleurisy. He prescribed it also in enemas, in conjunction with cummin and rue, for cephalea, and volvulus; externally in phrenitis, and tetanus: and, in the latter disease, it formed the principal ingredient in the cataplasms which were ordered to the injured part, upon the supervention of the tetanic symptoms. Prosper Alpinus enumerates the turpentines amongst the individual remedies of the *Theriaca* of the Egyptians; and that they greatly employed it in the middle ages, may be inferred from the later, but extravagant praises of Fernelius. "Terebinthina calefacit, mollit, discutit, terget, expurgat: viscerum omnium, maximeque renum, obstructiones tollit, et angustos meatus aperit, urinam ciet, putredinem cohibet." As the chemical remedies and the chemical doctrines of disease became disseminated through Europe, the province of the terebinthinous class of medicines became invaded, their boundaries more confined, and, with many other celebrated Galenicals, deprived of their due consideration. The diseases of the urinary organs were left, however, in their almost undisturbed possession; so that up to the present time, they have always attached to themselves a portion of attention in the alleviation and cure of disease.

Common turpentine. This variety is directed by the London and Edinburgh colleges to be chiefly used in external applications, for which, as we have stated before, it was much used by the ancients. The *Emplastum Lythargyri compositum*, and *Unguentum Elemi compositum*, both contain it as a principal ingredient, on account of its supposed powers in digesting, cleansing, and incarnating wounds.

Resin (Resina alba vel flava) is only employed in the composition of ointments and plasters, for its adhesive, or its stimulating properties.

Tar was formerly considered almost as a *panacea*, and there is no end to the praises that have been bestowed upon it. Dr. Berkeley, Bishop of Cloyne, wrote a dissertation on

Tar Water, under the title of "*Siris, or a Chain of Philosophical Reflections and Enquiries concerning the Virtues of Tar Water.*" Mr. Thomas Prior also published a great number of cases, and remarks on its virtues: and from their account, and Cullen's, it appears to strengthen the tone of the stomach, to excite appetite, promote digestion, and remove dyspeptic symptoms.

Tar Vapour has been recommended by Dr. Crichton for phthisis pulmonalis, and there is little doubt but that some persons have been benefited by its use. Mr. Ward, of Maidenhead, has also narrated cases of its success in asthma. The London and Edinburgh colleges direct tar to be made into an ointment; (*Ungentum Picis;*) the former by means of the admixture of an equal portion of mutton suet; and the latter, of two-fifths of yellow wax. This ointment has been much employed for the cure of cutaneous affections, particularly those of domestic animals: and although the barbarous practice of the *pitch cap* is now justly exploded, we have seen the application of this salve, of eminent service in porrigo of the scalp.

Burgundy Pitch is employed only externally. It enters into the composition of the *Emplastrum Cumini*, and the *Empl: Picis Burgundicæ compositum*. It forms a warm stimulant application, and sometimes occasions vesications; though, in general, a redness of the part, with a gentle exudation, are the only effects observable. The cases in which the last-mentioned plaster seems to produce most good, are those which may be called *nervous dyspnœa;* but it is also serviceable in coughs, pains of the muscular parts of the chest, and some affections of the trachea, occasioning loss of voice.

Venice Turpentine is substituted, in medicine, for the true or Chian turpentine, under those circumstances to which the latter is supposed to be particularly suited. As a diuretic, the Venice turpentine is generally preferred to all the other sorts, and it loosens the belly most, on which account Riverius thinks it more safe than most other irritating diuretics. Cullen observes, that when it is employed as an *enema*, its effects are more certain and durable than those of saline medicines, for remedying obstinate constipations of the bowels. Other prac-

titioners have employed it with advantage in some nephritic cases, exhibiting it in a similar form, by the *rectum*. It forms a part of several plasters and ointments; as, for instance, the *Emplastrum de Belladonna* of the Brunswick Pharmacopœia, the *Unguentum Infusi Cantharidum* (Ed;) and the *Unguentum divestigum* of the Russian shops.

Essential Oil, or Spirits of Turpentine. Of all the terebinthinous remedies, the essential oil is the most esteemed; and since Dr. Copland published his valuable paper on this subject, (from which we have derived much of the information that we are able to communicate,) many prejudices against its employment have been dissipated, and its utility from day to day more fully confirmed. It is evident from the violet odour that it communicates to the urine, and from other circumstances, that it is a powerful stimulant, capable of being particularly directed to the urinary organs; and from this specific action it is often given for gleet, in doses of from ten to thirty drops. Cheyne and Pitcairn particularly recommended it for chronic rheumatism, and were followed by Cullen, and Home. The latter gave it in the form of linctus, consisting of two drachms of the oil, and one ounce of honey; and of this a teaspoonful was taken twice, or thrice, in twenty-four hours. This was the same formula as recommended by Cheyne; and, from the cases related by Home, it appears to have generally cured the disease. When this remedy is employed for chronic rheumatism, it may be taken either in the small or medium doses, combined with any of the preparatives of cinchona, or senega, &c. triturated with mucilage into the form of a draught; to which *tinct. capsici*, or *tinct. cardam.*, or *spirit armorac. comp.* with a drop of some essential oil ought to be added. Dr. Copland prefers the capsicum annuum to any other, both as an adjuvant, and corrigent to other remedies; having ascertained, that if given in considerable quantities, in the form of pills, it will remove this disease as soon as any other remedy.

For *sciatica* and *lumbago* the following linctus is efficaciously administered; but the operation of the turpentines must be closely watched lest they affect the urinary organs.

R. Mellis optimi ℥ii.
Olei terebinthinæ.
Tinct. Guiaci Ammon. ā ā ʒij.
Olei Caryophil.
—— Limonis ā ā gtt. iii.—Misce ut fiat linctus: cochleare unum minimum bis terve de die sumendum.

For *passive* hæmorrhages, and petechiæ, we have seen it most advantageously given; and in *atonic epistaxis* of children, and in *hæmoptysis*, accompanied with debility, it has been resorted to with advantage. For *hæmorrhoids*, seated high up in the rectum, more especially after repeated attacks have debilitated the patient, the spirit of turpentine is of great service, as well as in *chronic dysentery*, and *chronic diarrhœa*. For *epilepsy* it has often been given with decided advantage; and we could narrate several instances of its remarkable success in this disease, of very long standing, which appeared to us to be kept up, more through habit, than from the existence of organic lesion. Several other spasmodic diseases, as *chorea* and *tetanus*, are recorded to have been cured by its internal use, and, in the hands of Dr. Copland, we have *seen* its beneficial effects produced in a variety of maladies; which he has fully adverted to in the 46th volume of the Medical and Physical Journal.

Large doses, from one to two ounces, are sometimes given in the last stages of puerperal fever; and numerous cases are recorded of its producing copious evacuations, whereby tension of the belly is removed, and the disease arrested. After purging and leeching, employed in the same disease, we have known drachm doses to be most advantageously and repeatedly employed, and, by applying it hot to the abdomen in the earliest stages of that fatal malady, it is generally arrested in its progress, as numerous cases that have occurred lately in the Queen's Lying-in Hospital, under the superintendence of Dr. Copland, testify.

It has also been introduced as an anthelmintic of great power, and was first recommended by Dr. Fenwick, in Vol. ii. of the Medico-chirurgical Transactions, especially for the removal

of Tœniæ; by giving two ounces at a time, and repeating it in ounce doses, if necessary; purging is generally produced; and the worm is usually evacuated lifeless. Its operation on the bowels, says Dr. Murray, as a cathartic in these large quantities, seems to prevent its absorption, and therefore obviates its action on the urinary organs; and it has been stated in conformity to this, that the action, giving rise to stranguary, is more likely to happen from small, than large doses. Analogy leads to the employment of the same remedy, for the expulsion of other worms, and in some cases *lumbrici* have been expelled. It has also been employed under the form of enema, half an ounce being diffused in mucilage, or in water, by the medium of the yolk of an egg. The nauseating effect on the stomach is thus avoided, but this mode is frequently productive of pain.

Externally, it is also employed as a rubefacient; and, what is very curious, if applied to the skin of a horse, dog, cat, and some other animals, it acts like scalding water, blisters the skin, and produces intense pain.

Its most important use, however, as a topical application is, as a remedy for extensive burns and scalds, when recently inflicted. Dr. Kentish, of Newcastle, appears to have been the first to introduce the oil of turpentine; and has published several cases, in which it was employed with the most beneficial effect. In applying this remedy, the great object is to avoid the *cooling process of evaporation*, and we are directed to proceed in the following manner: the injured parts are to be bathed two or three times over with the oil, or with spirits of wine, which answers the same purpose, heated by standing in hot water. After this a liniment, composed of the unguentum resinæ, softened with oil of turpentine, *(Linimentum terebinthinæ,)* is to be spread on soft cloth, and applied. This liniment is to be renewed only once in twenty-four hours, and, at the second dressing, the parts are to be washed with proof spirits. When the secretion of pus takes place, milder applications must be had recourse to, till the cure is effected. During the use of the turpentine it is of the utmost importance that the injured surface should be left uncovered as little as possible; it is therefore recommended to let

the fresh plasters be quite ready before the old ones are removed, and then only to take off one piece at a time. When the inflammatory action has somewhat abated, the exciting means should also be diminished, and warm proof spirits, or laudanum, may be substituted for the oil, and the unguentum resinæ flavæ is to be mixed with oleum camphoratum instead of turpentine. If this should be found too irritating, Dr. Kentish recommends ceratum plumbi acetatis, or the common calamine cerate. When this mode of treatment is adopted, æther, or alcohol, and other stimulants, with opium, are to be immediately given in proportion to the degree of injury, and repeated as circumstances may require. In slight burns in which the *action of the part only is increased*, he has not found any thing better for the first application than the heated oleum terebinthinæ and ceratum resinæ thinned with the same.

Pl 76



Acacia Catechu.

ACACIA CATECHU.

Catechu, or Medicinal Acacia.

Class XXIII. Polygamia.—*Order* I. Monœcia.

Nat. Ord. Lomentaceæ, *Lin.* Leguminosæ, *Juss. De Cand.* &c. Cicerinæ, Mimosaceæ, *Burn.*

Gen. Char. Flowers polygamous. *Calyx* 4-5-toothed. *Corolla* 5-cleft, or formed of four or five petals. *Stamens* 10—200. *Pistil* 1. *Legume* bivalved, dry.

Spec. Char. *Prickles* stipular, hooked when old, in pairs. *Leaves* pubescent, bi-pinnate; first division of ten or twelve pair; second of many pair; with a gland at each extremity of the common foot-stalk. *Spikes* cylindrical, axillary, two or three together.

Syn.—Mimosa Catechu, *Lin. Suppl.* 409; *Woodv. Med. Bot.* 183. *t.* 66; *Roxb. Coromand. v.* 2. *p.* 40. *t.* 175.
Terra Japonica; *Kerr in Med. Obs. & Inq. v.* 5. *p.* 151. *t.* 4.
Acacia Catechu, *Willd. v.* 4. *n.* 73; *Ait. Kew. v.* 5. *n.* 44.

Foreign.—*Cachou, Acacia du Cachou,* Fr.; *Cacciù; Catechù; Catto d'India,* It.; *Cachu,* Sp.; *Katechubaum,* Ger.; *Katechu-boom,* Dut.

Professor Willdenow, who established the genus to which the subject of the present article belongs, first separated it from the Linnean Mimosa, by the characters of the fruit. Under Mimosa, he leaves such species as have a *lomentum*, or legume, separating into single-seeded joints. Of these he defined thirty-two, but the list now exceeds seventy; and to many of them, being sensitive, the name Mimosa is very appropriate. Willdenow enumerated a hundred-and-two species of Acacia, but

since his time the discoveries of modern travellers have augmented the catalogue, so that upwards of three hundred now are known. They are all shrubby, perennial plants, with the exception of two or three species, which are herbaceous.

The Acacia *Catechu*, called in the province of Bahar, *coira* or *caira*, grows in great abundance in most of the mountainous districts of Hindustan. It is a large shrub or tree, fifteen or twenty feet high, covered with a thick, scabrous, ferruginous bark, which is very red within, remarkably astringent, and somewhat bitter. The branches are round, spreading irregularly, and downy when young; the older ones beset with numerous pairs of small recurved spines, originating in the stipules. The leaves are placed alternately on the younger branches, and are composed of from fifteen to thirty pair of pinnæ, about two inches long, each having numerous linear leaflets, (often forty pair,) hardly a quarter of an inch long, covered with short hairs, and of a pale green colour. The common petiole is sometimes furnished with a few recurved prickles, and a small gland is placed between the bases of each pair of the pinnæ. The flowers are hermaphrodite and male; axillary, on slender cylindrical spikes, three or four inches long, hairy, stalked, and of a pale yellow colour. The calyx is tubular, hairy, and 5-toothed; the corolla of one piece, whitish, divided into five segments, and twice the length of the calyx. The filaments are numerous, crowned with roundish anthers, and united at the base with the germen, which is oval, supporting a slender style, and terminated by a simple stigma. The fruit is a straight, smooth, pointed legume, or pod, three or four inches long, and less than one broad, containing six or eight roundish seeds.

Catechu was formerly supposed to be an earth, found in Japan; and the name *Terra Japonica*, by which it is still designated occasionally, tends to perpetuate the error. Mr. Kerr, assistant surgeon to the Civil Hospital in Bengal, was the first to describe the catechu tree, in Vol. V. of "Medical Observations and Enquiries," which contains also a very correct figures. He says, that it is one of the most common trees to be met with in the uncultivated mountains of Rotas, and Pallamow, which are

districts of Hindustan, in the province of Bahar, westward of Bengal; and is frequent in many other parts of that country, in various soils. The following is the mode of preparing the Extract, as described by that gentleman:—

"After felling the trees, the manufacturer carefully cuts off all the exterior white part of the wood. The interior coloured wood is cut into chips, with which he fills a narrow-mouthed unglazed earthen pot, pouring water upon them until he sees it among the upper chips; when this is half evaporated by boiling, the decoction, without straining, is poured into a flat earthen pot, and boiled to one third part; this is set in a cool place for one day, and afterwards evaporated by the heat of the sun, stirring it several times in the day; when it is reduced to a considerable thickness, it is spread upon a mat or cloth which has previously been covered with the ashes of cow dung; this mass is divided into square or quadrangular pieces by a string, and completely dried by turning them frequently in the sun, until they are fit for sale.

"This extract is called *cutt* by the natives, by the English *cutch*, by authors, *terra Japonica, catechu, cadtchu, cashow, cachou, caitchu, caitjoe, cachore, kaath, cate,* &c. In making the extract, the pale-brown wood is preferred, as it produces the fine whitish extract: the darker the wood is, the blacker the extract, and of less value. They are very careful in drying their pots upon the fire before they are used; but very negligent in cutting their chips upon the ground, and not straining the decoction; by which, and the dirty ashes they use, there must be a considerable quantity of earth in the extract, besides what avarice may prompt them to put into it. This the learned have proved from their laborious chemical decompositions. The extract thus prepared, is bought from the manufacturer for twelve or fifteen shillings the eighty pounds weight. I could never learn that the *terra Japonica* was produced from the *areca* or *betel-nut;* nor is it indeed credible that it should, notwithstanding that this is the general and received opinion, for the *betel-nut* is scarce ever so low in price as the *terra Japonica,* and was it to be extracted from thence, the price would be twenty times dearer than the present sales. Where the *areca nut* is in great plenty, they may perhaps join some of the fruit in making the extract, to answer a double purpose, for the most frequent use of both is in chewing them together as Europeans do tobacco; to these two substances they add a little shell lime, and a leaf called *pauw.* Here I am obliged to have recourse to the natives, whom from experience I have found to be very fallacious, therefore I will not answer for their veracity.

"The extract is much used in dyeing and painting chintz, and other cloths; combined with vitriolic salts, a black colour is produced; mixed with oil, they paint the beams and walls of houses to preserve them, and to defend them from the destructive white ants; it is sometimes mixed with their wall plaister.

"The black physicians of this country divide the diseases of mankind, as well as their medicines, into hot and cold; to the cold disease they

oppose a hot medicine, and to the hot disease a cooling medicine, among which last this Extract is supposed to be very powerful. When too profusely used, it is said to be a destroyer of venereal pleasures. It is given at the rate of two ounces per day to tame vicious horses.

The Furnace used in making the Extract.—Dig a hole in the earth five or six feet long, two feet deep, and two feet wide; cover this with an arch of clay, leaving one end open to receive fuel, and take out the ashes; in the arch, three or four circular openings are made, adapted to the bottoms of the pots: the same structure may be raised above ground, made of clay. This furnace is very valuable for its simplicity, easy construction, and small expense of fuel.

"The extract is a principal ingredient in one of their ointments of great repute, composed of blue vitriol four drachms, Japan earth four ounces, alum nine drachms, white resin four ounces; these are reduced to a fine powder, and mixed with the hand, adding olive oil ten ounces, and water sufficient to bring the mass to the proper consistence of an ointment. This ointment is used in every sore, from a fresh wound to a venereal ulcer. A gentleman (Mr. Robert Hunter, Surgeon to the Patna Factory) of great practice, told me, he used this ointment with success beyond expectation; and he remarks, that whether it is owing to the laxity of the solids in this hot climate, or to some other cause, he is clearly of opinion, that our greasy ointments have not the desired effect. Certain it is they avoid that *empyreuma* which our ointments often receive in boiling, which cannot be a promising application to a tender sore. As to the virtues of this Extract in European practice, I must be silent; they are already better described than I can pretend to do."

Qualities and Chemical Properties.—There are two kinds of this extract; one is sent from Bombay, the other from Bengal;* but they differ from each other more in their external appearance, than in their chemical composition. The extract from Bombay is of a uniform texture, and of a red-brown tint; its specific gravity being generally about 1.39. The extract from Bengal is more friable, and less consistent; its colour is like that of chocolate externally, but when broken, its fracture presents chocolate and red-brown streaks. Its specific gravity is about 1.28. Their tastes are precisely similar, being astringent, but leaving in the mouth a sensation of sweetness. They do not deliquesce, or apparently change, by exposure to the air. Solutions copiously precipitate gelatine, and speedily tan skins. The strongest infusions of the two kinds do not differ

* A sort of Catechu or *gutta gambir*, made in Sumatra, Prince of Wales' Island, &c. has been shown by Mr. Hunter, secretary to the Asiatic Society, to be the produce of a species of *Nauclea*; hence, probably, the two sorts of Catechu known to druggists may be thus accounted for.—*Trans. Lin. Soc. vol.* ix. p. 209.

sensibly in their nature or composition. Their colour is deep red-brown, and they communicate this tinge to paper; they slightly redden litmus paper; their taste is highly astringent, and they have no perceptible smell. The strongest infusions act upon the acids, in a manner analogous to the infusion of galls. Sulphuric and muriatic acids precipitate them. With strong nitrous acid they effervesce, and lose their power of precipitating solutions of isinglass and the salts of iron. The pure alkalies enter into union with their tannin, so as to prevent it from being acted upon by gelatine. Solutions of lime, of strontia, and of barytes, poured into the infusions of catechu, produce copious precipitates. If carbonate of magnesia be added to the infusion, it loses its power of precipitating gelatine. The carbonates of potash, of soda, and of ammonia, also deprive them of their power of acting upon gelatine; though this power is restored by an acid. Solution of muriate of tin acts upon the infusion of catechu, in a manner similar to that in which it acts upon the infusion of galls. Both kinds of catechu are almost wholly soluble in large quantities of water; and to form a complete solution, about eighteen ounces of water, at 52°, are required to a hundred grains of extract. A considerable portion of both kinds of catechu is soluble in alcohol; but, after the action of the alcohol upon it, a substance remains, of a gelatinous appearance, and a light brown colour, which is soluble in water, and is analogous in its properties to gum or mucilage.

The peculiar extractive matter of the catechu, is much less soluble in water than the tanning principle; and when a small quantity of water is used to a large quantity of catechu, the quantity of tannin taken up is much greater than that of the extractive matter. The extractive matter is much more soluble in warm water than in cold; and when saturated solutions of catechu are made in boiling water, a considerable quantity of extractive matter, in its pure state, falls down, as the liquor cools. An aqueous solution of the extractive matter, when mixed with solutions of nitrate of alumine, and of muriate of tin, becomes slightly turbid. Nitrate of lead gives a dense brown precipitate. It is not precipitated by the mineral

acids. Two hundred grains of Bombay Catechu, afforded 109 of tannin, 68 of extractive matter, 13 of mucilage, and 10 of sand, calcareous earth, and other impurities. The variety from Bengal gave, by a similar analysis, 97 of tannin, 73 of extractive matter, 16 of mucilage, and 14 of residual matter, and sand, with a small quantity of calcareous and aluminous earth, in two hundred grains.

Medical Properties and Uses.—Catechu is largely employed in the east, medicinally; but especially when used with the *betel-nut* for chewing, a practice almost universal over the Indian continent.

In this country it is extensively employed for all those disorders in which a mild, unirritating, powerful astringent is required; such as chronic diarrhœa and dysentery; hœmorrhoidal and uterine hœmorrhages, leucorrhœa, gleet, &c., and the Bombay catechu, as containing the greatest portion of tannin, is that which is best adapted for medicinal use. It is one of the most valuable medicines of this class, and may be advantageously used in all cases where we wish to restrain immoderate discharges, especially when not attended by inflammatory action, or produced by congestion. With this indication, it is usually combined with the bitter tonic and aromatic barks. It is also used in the form of troches, mixed with gum-arabic and sugar, to dissolve slowly in the mouth; and in this form it often much assists the clearness of the voice in persons that have occasion to speak long in public. As a topical astringent it is used in scorbutic affections of the gums, and aphthous ulcerations of the mouth and fauces. Dr. Thomson has found the slow solution of a small piece in the mouth, "a certain remedy for the troublesome cough induced by a relaxed uvula, hanging into, and irritating the glottis."

Dose.—From gr. x. to ʒi. of the Powder; or, ʒi. to ʒiij. of the Tincture.

Off. Prep.—Infusum Catechu. L. E. Tinctura Catechu, L. E. Electuarium Catechu compositum, E. D.

Pl 77.



Acacia vera

Waldstein Fecit

ACACIA VERA.

Egyptian Gum-Arabic Acacia, or Egyptian Thorn.

Spec. Char. *Spines* stipulary, in pairs, linear-awl-shaped. *Branches* and *Leaves* glabrous, the latter doubly pinnate; first division of eight or ten pair; second of many pair; common stalk glandular. *Heads* axillary, about three together. *Legume* necklace-like, nearly flat, smooth.

Syn.—Mimosa Nilotica, *Lin. Sp. Pl.* 1506; *Haselq. Travels, Engl. ed.* 250; *Woodv.* 187. *t.* 67.

Acacia vera, *Willd.* 4. 1085. *n.* 87. *Ait. Hort. Kew. v.* 5. *n.* 48; *Bauh. Hist. v.* 1. *p.* 2. 429; *Vesling Ægypt.* 6 *t.* 6.

Ακακια, *Diosc.* 1. 1. cap. 133.

Foreign.—*Acacia*; *Acacia vrai*, Fr.; *Acacie d'Egypte*, Lamarck; *Gommier Rouge*, Adanson.; *Acacia*; *Acazia*; *Acacia vera*; *Acacia egiziana*, It.; *Acacia*, Sp.; *Mimosa do Nilo*; *Acacia verdaiteiro*, Port.; *Die whre orde agygptische Acacia*, Ger.; *Egyptische Acacia*, Dut.

This plant, which affords the finest Gum Arabic of commerce, was originally referred by Linneus to the extensive genus Mimosa, under the title of Mimos *Nilotica*; but it has been removed by Willdenow with other species to the genus Acacia. It is a native of the sandy deserts of Arabia, Egypt, and the western parts of Asia; and, according to Mr. Jackson, grows abundantly in Barbary, and other parts of Africa. The original gum-arabic tree was known to the earlier botanists, and appears to have been cultivated by Gerarde in 1596; but few persons are acquainted with living, or even dried specimens, especially of the legume. Our figure was made from a dried specimen, (perhaps the only one in this country,) in the herba-

rium of A. B. Lambert, Esq. F. R. S., which was brought from upper Egypt, by Dr. Clarke, as the Acacia *vera*.

This, like the preceding species, rises several feet in height; the stem is crooked, and covered with a smooth grey bark, which on the branches has a yellowish green, or purplish tinge. The leaves are alternate, bipinnate, composed of several pairs of opposite pinnæ, with numerous pairs of small, deep green, smooth leaflets. At the base of the leaves are two opposite awl-shaped spines, nearly erect, and having a slight, glandular swelling below. The flowers are of a bright yellow colour, and collected into globular heads, four or five together, upon slender foot-stalks, that arise from the axillæ of the leaves. Immediately below each head of flowers, is placed a pair of small, ovate bracteas. The calyx is bell-shaped and 5-parted; the stamens are numerous, thread-like, and furnished with roundish, yellow anthers; the germen is conical, with a slender style and simple stigma. The legumes are four or five inches long, moniliform, nearly flat, smooth, of a pale brown colour, and contracted into numerous orbicular portions, in each of which is lodged a flattish seed. This character, as a distinguished botanist justly observes, clearly distinguishes the present species from Acacia *Arabica*; it being more strictly contracted into orbicular portions, with an obliquity well expressed in the wooden cut of Veslingius.

The gum, says Mr. Jackson, called Morocco or Barbary gum, is produced from a high, thorny tree, called *Attaleh*, having leaves similar to the *Arar*, or Gum Sandrac tree, and the juniper. The best kind of Barbary gum is procured from the trees of Morocco, Ras-el-wed, in the province of Suse, and Bled-hummer, in the province of Abda: the secondary qualities are the produce of the Kedma, Duguella, and other provinces. The tree grows abundantly in the Atlas mountains, and is found also in Bled-el-jerrêde. The gum, when new, emits a faint smell, and when stowed in the warehouse, it is heard to crack spontaneously for several weeks; and this cracking is the surest criterion of new gum, as it never does so when old: there is, however, scarcely any difference in the quality. The wood (of the tree) is hard and takes a good polish; its seeds, which are enclosed in a hard-

coriaceous pericarp, resemble those of the lupin, yield a reddish dye, and are used by the tanners in the preparation of leather These seeds attract the goats, who are very fond of eating them. The more sickly the tree appears, the more gum it yields; and the hotter the weather, the more prolific it is. A wet winter, and a cool, or mild summer, are unfavourable to gum.—(Jackson's Hist. of Morocco, fol. 84.)

The purest and finest gum-arabic is brought in caravans to Cairo, by the Arabs of the country round Mount Tor and Sinai; they bring it from this distance on the backs of camels, sewn up in bags, and often adulterated with sand and other matters. The gum exudes spontaneously from the bark of the trunk and branches of the tree, in a soft, or nearly fluid state, and hardens by exposure to the air, or heat of the sun. It begins to flow in December, immediately after the rainy season, near the flowering time of the tree. Afterwards, as the weather becomes hotter, incisions are made through the bark to assist the transudation of the juice. All the gum that was employed in medicine, or the arts, was formerly brought from Arabia, or from Egypt, whence its name was derived; and it was not till about two hundred years ago, that the gum of Senegal was introduced into commerce. That adventurous and persevering naturalist, Adanson, who explored the district of the river Senegal with so much assiduity, contributed to extend our knowledge of the trees from which the gum might be procured in the western parts of Africa; and at present nearly the whole of what is imported into Europe comes from that country.

Several kinds of gum, yielded by different trees, are occasionally to be met with, but that which is commonly substituted for it, as we have already observed, is brought from the island of Senegal, on the coast of Africa, and is called *Gum Senegal*. It is generally in larger masses, and is of a darker colour; is more tenacious, and breaks with a vitreous, even fracture. It is not so soluble in water as the true Gum Arabic, and leaves at the bottom a stringy substance.* It is the sort chiefly employed

* The name of *Cerasin* has been applied to those gummy substances which readily dissolve in boiling water, but separate again from it in a gelatinous mass.

by the calico-printers, but does not go so far in thickening water. In India, what is termed the *Babul* tree, (Acacia *Arabica*,) furnishes a very fine gum, which is extensively employed in the place of Gum Arabic; and Dr. Ainslie thinks that it is the same tree that is referred to by Dr. Wittman, in his Travels, (p. 231,) as yielding Gum Arabic in Turkey. It is in small clear masses, of a semi-transparent or very pale yellow colour; but it is essential to have this gum well garbled in India; and care should be taken that it is not intermixed with a gum resembling it, but generally in larger pieces, which is quite worthless. The Feronia *elephantum* of Roxburgh also yields a valuable gum, similar to Gum Arabic, which is commonly used by all the practitioners of Lower India; and, according to Dr. F. Hamilton, gum, simply so called, may be procured in the Mysore, from the Melia *Azederach;* Chironia *glabra;* Mangifera *indica;* Cassia *auriculata;* Ægle *marmelos;* Shorea *robusta*, and several other trees

Qualities and Chemical Properties.—Gum Arabic is usually met with in small pieces, like tears; moderately hard; somewhat brittle, and may be reduced to a fine white powder. When pure, it is colourless, but has commonly a yellow tinge, and is not destitute of lustre. It has no smell. Its taste is insipid. Its specific gravity varies from 1.3161 to 1.4317. Water may be said to dissolve it entirely. The solution is known by the name of *mucilage;* which is thick, and adhesive: it is often used as a paste, and to give stiffness and lustre to linen. When spread out thin, it soon dries, but readily attracts moisture, and becomes glutinous. When mucilage is evaporated, the gum is obtained unaltered. It may be kept for years, without undergoing putrefaction. When gum is exposed to heat, it softens and swells, but does not melt; it emits air bubbles, blackens, and at last, when nearly reduced to charcoal, emits a low blue flame. After the gum is consumed, there remains a small quantity of white ashes, composed chiefly of the carbonates of lime and potash. Vegetable acids dissolve gum without alteration: the strong acids decompose it. Chlorine converts gum into nitric acid, according to the experiments of Vauquelin. If nitric acid be slightly heated

upon gum till it has dissolved it, and till a little nitrous gas is exhaled, the solution, on cooling, deposits saclactic acid. Malic acid is formed at the same time; and if the heat be continued, the gum is at last changed into oxalic acid. Thus, no less than three acids are developed by the action of nitric acid on gum.

Gum is insoluble in alcohol and ether, and both precipitate mucilage.*

From the experiments of Vauquelin, it appears that gum contains traces of iron; and he conjectures, that the lime which it contains is usually combined with acetic or malic acid. Berzelius analysed it, by burning it along with chlorate of potash, and found it composed of,

Oxygen	51.306
Carbon	41.906
Hydrogen	6.788
	100.000

Medical Properties and Uses.—Gum arabic is extensively employed for a number of purposes, both in the arts and in medicine. It is frequently used either to suspend in water various substances, which could not otherwise be kept equally diffused in that liquid, or as a useful, colourless cement. Gum Senegal resembles gum arabic so nearly, that it is employed instead of it for all purposes in Hindustan; and in this country is used in very large quantities by the calico-printers to mix the colours and the mordaunts in block printing. Gum arabic forms the basis of crayons, and the cakes of water-colours; and of several liquid colours, of which common writing ink is a familiar example.

All the vegetable mucilages are considerably nutritious; hence in the countries where the gum arabic and Senegal grow native, they form an important article of diet, either alone or mixed with milk, rice, and other substances. In Guzerat, especially in the wastes, where the Balbul tree (Acacia *arabica*) is very common, the poorer inhabitants use the gum for food. Haselquist informs

* Thomson's System of Chemistry, vol. iv. p. 36.

us, that a caravan whose provisions were exhausted, preserved themselves from famine, by the gum arabic, which they were carrying as merchandise.

In medicine, this gum is used either by itself, or as a vehicle for other substances. Taken internally, its principal use is as a demulcent; to envelop acrid matter, and to cover the surfaces that are too sensible to external impressions. Hence it is sometimes allowed to dissolve gradually in the mouth, to allay irritation of the fauces; and its mucilage, sweetened with syrup, forms a useful remedy for tickling coughs, hoarseness, and diarrhæas; as well as in cardialgia, arising from oily substances received into the stomach. In these cases, it is sometimes advantageously joined with opiates and aromatics. Though its action has been supposed not to extend beyond the fauces and alimentary canal, it has been frequently recommended in tenesmus, strangury, gonorrhœa, gravel, and in almost all diseases of the urinary organs. It is given, either in powder, or dissolved in almond milk, &c. one ounce being sufficient to render a pint of liquid tolerably viscid.

In pharmacy, gum arabic is employed to render oils, balsams, and resins, miscible with aqueous liquids; and to give tenacity to substances made into troches and pills. Even Mercury may be suspended in water, by being rubbed for a considerable time with gum arabic; which preparation is called, from its inventor, *Plank's solution.*

The pharmaceutical preparations into which gum arabic enters as a principal ingredient, are the *Mucilago Acaciæ*, a simple solution of one part of the gum in two of boiling water; the *Emulsio Acaciæ Arabicæ*, *Ph. Ed.* which is gum arabic dissolved in almond milk; the *Trochisci gummosi*, *Ed.*, with equal parts of gum, starch, and sugar; and the *Pulvis Tragacanthæ compositus*, *Ph. Lond.*, a powder made of tragacanth, gum arabic, starch, and sugar. It is also an ingredient in the *Confectio amygdalarum*, L. *Mistura cornu usti*, L. *Mistura cretæ*, L. *Mistura Moschi*, L. *Mistura Guaiaci*, L. and the *Pulvis cretæ compositus*, L.



Anagallis procumbens

MERCURIALIS PERENNIS.

Perennial, or Dog's Mercury.

Class XXII. Diœcia.—*Order* VIII. Enneandria.

Nat. Ord. Tricoccæ, *Lin.* Euphorbiæ, *Juss.*
Euphorbiaceæ, *De Cand, Burn. &c.*

Gen. Char. Barren fl. *Calyx* 3-parted. *Corolla* 0. *Stamens* 9—12. *Anthers* globose, 2-celled. Fertile fl. *Calyx* 3-parted. *Corolla* 0. *Styles* 2. *Capsules* 2-celled. *Seeds* solitary.

Spec. Char. *Stem* perfectly simple. *Leaves* rough. *Root* creeping, perennial.

Syn.—Mercurialis perennis repens, cynocrambe dicta, *Raii. Syn.* 138.
Cynocrambe, *Ger. Em.* 333. *f.*; *Fuchs. Hist.* 444. *Ic.* 250. *f.*; *Matth. Valgr. v.* 2. 635. *f.*
Cynocrambe mas et fœmina, *Camer. Epit.* 998.; *Bauh. Hist. v.* 2. 979. *f.*
Mercurialis, *n.* 1601. *Hall. Hist. v.* 2. 277.
Mercurialis perennis, *Lin. Sp. Pl.*; *Wild. v.* 4. 809; *Fl. Brit.* 1083; *Eng. Bot. v.* 26. *t.* 1872; *Hook. Scot.* 289; *Curt. Lond. fasc.* 2. *t.* 65; *Fl. Dan. t.* 400; *Bull. Fr. t.* 303.

Foreign.—*Mercuriale sauvage, ou de montagne*; *Choude Chien*, Fr.; *Mercorella montana*, It.; *Kerza perunna*, Sp.; *Das perennirende oder bestandidge Bingelkraut, Wildes Bingelkraut*, Ger.; *Vild: bingelurt*, Dan; *Bingelgras*, Swed.; *Proleska*, Russ.

Two species of this genus are indigenous to Britain, viz. the perennial or Dog's Mercury, (Mercurialis *perennis*,) and the annual or French Mercury, (Mercurialis *annua*.) The former has obtained a place in our work on account of its poisonous qualities, and the latter was at one time in considerable repute as

an article of the materia medica. Dog's mercury is a common plant, growing everywhere in shady groves and hedges; flowering in April and May.

The root is creeping, white, and very fibrous. The stem is erect, perfectly simple, round, leafy, naked below, thickest at the joints, slightly winged alternately, and rises to the height of a foot or more. The leaves stand in opposite pairs, on short footstalks; they are ovate, acute, serrated, two or three inches long, with two small, pointed stipules, at the base of the footstalks. The flowers proceed in slender, erect spikes, from the axillæ of the leaves, near the top of the stem; in the barren, or male plant, longer than the leaves; in the female, concealed among them. The flowers in the fertile plant are few; in the barren ones numerous, sessile, growing in a short, interrupted spike, and half surrounding the stem. The barren flowers have from nine to twelve capillary, erect stamens, bearing globular, two-lobed anthers: there is no corolla; and the calyx, in both, is divided into three deep, ovate, concave, spreading segments. The germen is superior, roundish, compressed, with a furrow at each side, supporting two spreading, inflexed, tapering, rough styles, having acute stigmas. Two awl-shaped bodies, found occasionally at the opposite side of the germen, and rising above the styles, are supposed to be the nectaries. The seed-vessel is a two-lobed, globular capsule, two-celled, and containing a single, roundish seed in each cell, of a brownish, purple colour. Fig. (*a*) represents the calyx; (*b*) a single fertile flower; (*c*) the capsule and seeds; (*d*) the stamens, with their anthers, and the calyx.

The male and female flowers are seldom found intermixed, each sex usually growing in large patches; whence it has been inferred, that this plant increases principally by the root, rarely producing perfect seeds.

Qualities.—The whole herb has a very nauseous taste, and a heavy, disagreeable odour. When dried, the leaves often assume a bluish tint, indicating its affinity, as a distinguished writer in Rees' Cyclopedia has well remarked, to Croton *tinctorium*. Notwithstanding its strong, unpleasant flavour, dog's mercury has

been eaten boiled as a pot-herb, when mixed with mucilaginous and oily substances; yet instances are not wanting of the fatal consequences of its use occasionally in this country. The following case, where it was mistaken for common English mercury, (Chenopodium *Bonus Henricus*,) and had nearly proved fatal to a whole family, is recorded by Sir Hans Sloane, in the 3rd edition of Ray's Synopsis:—

"W. Matthews, his wife, and three children, have been lately very ill, and like to die; the occasion and manner of their sickness was very odd, and therefore I shall give you a particular account of both. About three weeks ago, the woman went into the fields and gathered some herbs, and, having first boiled them, fried them with bacon for her own and her family's supper. After they had been about two hours in bed, one of the children (which is dumb, and about seven years old) fell very sick, and so did the other two presently after: which obliged the man and his wife to rise and take the children to the fire, where they vomited and purged, and within half an hour fell fast asleep. They took the children to bed as they were asleep, and they themselves went to bed too, and fell faster asleep too than they had ever done before. The man waked next morning about three hours after his usual time, went to his labour at Mr. Newport's, and so by the strength of his constitution carried it off; but he says he thought his chin had been all day in a fire, and was forced to keep his hat full of water by him all day long, and frequently dipt his chin in it as he was at work. The woman awoke awhile after her husband, and, being forced to it, got up to look after her little family concerns; but she was very sick, and has continued so till within these few days, since she is very well recovered. One of their children slept from that night, (which was Thursday three weeks,) till Monday evening following, and then (having just only opened her eyes, and made two sprunts,* without speaking one word,) died immediately while she was asleep; endeavours were used to awaken her, but in vain. The other two children slept about

* To Sprunt, v. n. (*sprengen*, Teut,) to spring up; to germinate, to spring forward.

twenty-four hours, and, upon their wakening, fell a vomiting and purging again, which I think saved their lives. By Mr. Newport's and my directions, they sent some of the same herb to the doctors and apothecaries in Salop, who generally say it is dog's mercury; but some say, it is a sort of night-shade: whatever it be, it is certainly poisonous, and it is observed that cattle never browse upon it: but I guess it to be a mistake..... I am no herbarist, but this I observed of the herb; it is branched and seeded something like spinage, or mercury, but leaved like lakeweed."—(*Philos. Trans.*, *No.* 203, for *September*, 1693.) Sir H. Sloane was afterwards furnished with some specimens of the plant, and found them to be dog's mercury.

Treatment.—The remedies to be applied in case of poisoning by this plant, will be the same as those recommended under the article Nicotiana *Tabacum*.

Mercurialis annua.

Annual, or as it is sometimes called, French Mercury, with branched stems, and smooth, glossy leaves, grows wild in waste or cultivated ground, chiefly in the more temperate parts of Europe. It occurs frequently near London, in Battersea Fields; and is figured in "*English Botany*," *v.* 8. *t.* 559. It may be at once distinguished from M. *perennis* by its annual root, branched stem, and smooth leaves, and by its flowering in autumn. This plant is mucilaginous, and was formerly much employed in enemas and emollient fomentations. It is sometimes eaten as spinage, and when used in considerable quantities, it operates as a cathartic. A syrup made from the leaves, given in the dose of two ounces, is said to prove a mild and useful laxative. According to Lamarck, the seeds are very fattening to those small birds, which the Italians call *Beccaficos*, or *Fig-eaters*, and which are so much relished by the epicures of the south of Europe.



Sambucus nigra

SAMBUCUS NIGRA.

Common Elder.

Class V. PENTANDRIA.—*Order* III. TRIGYNIA.

Nat. Ord. DUMOSÆ, *Lin.* CAPRIFOLIA, *Juss.*
CAPRIFOLIACEÆ, *De Cand.* &c.

GEN. CHAR. *Calyx* 5-cleft, *Corolla* rotate, 5-lobed. *Berry* 1-celled, 3-seeded.

SPEC. CHAR. *Cymes* with five main branches. *Leaves* pinnate; *leaflets* ovate, serrated. *Stipulas* obsolete. *Stem* arborescent.

Syn.—Sambucus, *Raii. Syn.* 461;' *Ger. Em.* 1422. *f.*; *Matth. Valgr. v.* 2. 606. *f. Camer. Epit.* 975. *f.*; *Fuchs Hist.* 64. *f.*
Sambucus acinis albis, *Raii Syn.* 461.
Sambucus laciniatis foliis, *Bauh. Pin.* 456. *Raii Syn.* 461.
Sambucus, *n.* 670. *Hall. Hist. v.* 1. 298.
Sambucus nigra, *Lin. Sp. Pl.* 395; *Willd. v.* 1. 1495; *Fl. Brit.* 336; *Eng. Bot. v.* 7. *t.* 476; *Hook. Scot.* 69; *Wvodv. v.* 1. *t.* 78.
FOREIGN.—*Le sureau, suzeau; Sambus,* Fr.; *Sambuco; Saugo; Samburago,* It.; *Sauco; Sauco negro,* Sp.; *Sabugueiro,* Port.; *Der Schwarze Hohlunder; Gemeiner Hohlunder,* Ger.; *Hyld; Hydetræe,* Dan.; *Fläder,* Swed.; *Vlierboom,* Dut.; *Busina, Bos derewo,* Russ.

THE Common Elder is a well-known native tree, growing in hedges and woods; flowering in June, and ripening its berries in September. In Scotland it is called Boretree or Bourtree.

The black berried Elder rises with a woody trunk, that is filled with a white medullary substance or pith, and covered externally with a rough, ash-coloured bark, to the height of fifteen or twenty feet. The younger branches are smooth when young, and contain a very large proportion of a light spongy pith. The

leaves are very long, of a shining green colour, and composed usually of two pair of leaflets, with an odd one, which are pointed, serrated, smooth, and nearly equal at the base. The flowers are numerous, cream-coloured, and form a large, beautiful cyme, with five principal branches, and many small ones at the extremity of the stem and branches. The calyx is superior, permanent, and cut into five deep segments; the corolla is synpetalous, nearly wheel-shaped, with five deep, obtuse, somewhat reflexed segments: the filaments are five, awl-shaped, about the length of the corolla, and bearing roundish, heart-shaped, yellow anthers. The germen is ovate, without a style; but supporting three obtuse stigmas. The berries are spherical, of one cell, containing three, sometimes two seeds, convex on one side, angular on the other. The berries have at first a reddish hue; but become of a purplish black colour when ripe. Fig. (*a*) represents a flower somewhat magnified; (*b*) the calyx, with the germen and stigmas; (*c*) the fruit.

There are two principal varieties of the common Elder; one of them with cut leaves, and hence called parsley-leaved elder; and the white-berried, Sambucus *acinis albis* of J. Bauhin. The berries of both are whiter, and more pleasantly flavoured than in the original species.

The generic name Sambucus occurs in the writings of Pliny and other ancient authors, evidently adapted from σαμβυκη, an instrument of music; in the construction of which, says De Theis, "the wood of this tree, on account of its hardness, was used."

Qualities.—The *inner bark* possesses little smell, but has a sweetish, bitter taste, that is succeeded by acrimonious effects. The flowers have an oppressive, sickly odour, which they yield to water; and, by distillation, an essential oil may be obtained from them. The berries, which are inodorous, have a sweet taste, and yield a purple juice, which is a delicate test for alkalies and acids.

Medical Properties and Uses.—The common Elder is the ακτη of the Greek writers; and we are informed by Dr. Ainslie, that the Arabians and Syrians of the present day are well acquainted with it; and use the inner green bark as an

aperient, and deobstruent. On account of these properties, it was used also by Boerhaave and Sydenham, in dropsies; and is still a popular remedy with the poor, in some parts of our own country. Its action, however, both as an emetic and cathartic, is occasionally so violent, that inflammation of the intestines has been produced, and death has been the result. The leaves and young buds are also purgative; and from the berries, which are supposed to be diaphoretic, a laxative syrup (olim *Rob Sambuci*) is ordered to be made, both by the Edinburgh and Dublin colleges.* The flowers, which, according to Linneus,† are poisonous to peacocks, were formerly administered in the form of infusion for erysipelas, rheumatism, small-pox, &c.;‡ but whether the diaphoretic effects which followed their use, are to be attributed to them, or to dilution, we cannot determine. Externally, they are still much recommended for their soothing effects; but we are sceptical, and venture to assert, that both fomentations and ointments would be quite as efficacious without them: indeed, what is sold for Elder ointment in the shops, is seldom a genuine article.

Œconomical Uses.—The ripe berries are in considerable repute, as affording a domestic wine, which, if properly prepared, and drank warm, with spices and sugar, is an excellent cordial. For making this wine, Mrs. Hewlett, in a valuable work, entitled "Cottage Comforts," which no peasant should be without, has given the following plain and wholesome directions: "If two gallons of wine are to be made, get one gallon of elderberries, and a quart of damsons, or sloes; boil them together in six quarts of water, for half an hour, breaking the fruit with a stick, flat at one end; run off the liquor, and squeeze the pulp through a sieve, or straining cloth; boil the liquor up again, with six pounds of coarse sugar, two ounces of ginger, two ounces of bruised allspice, and one ounce of hops; (the spice had better be loosely tied in a bit of muslin;) let this boil above half an hour; then pour it off; when quite cool, stir in a tea cup full of yeast, and cover it up to work. After two days, skim off the yeast, and put the wine into the barrel, and when it ceases to hiss, which will be in about a fortnight, paste a stiff brown paper over the bung-hole. After this, it will be fit for use in about eight weeks, but will keep eight

* The berries are said to be poisonous to poultry. *Barthol. Hist. anat. rarior. Cent.* iv. *p.* 248.

Flor. Suec. p. 79.

‡ Usitatissimi sunt flores sambuci in praxi medica, atque sub forma infusi *frequenter* bibuntur in Erysipelate, &c. (*Bergius, fol.* 245.)

years, if required. The bag of spice may be dropped in at the bung hole, having a string fastened outside, which shall keep it from reaching the bottom of the barrel."

The wood of the common Elder is commonly made into skewers for butchers, tops for angling rods, and needles for weaving nets. The pith, being very light, is cut into balls used in electrical experiments.

Dose.—The dose of the bark is from grs. x, to ʒss.; or half an ounce may be boiled in a pint and a half of water, down to twelve ounces, and divided into three equal doses.

Off. Prep.—Succus spissatus Sambuci nigræ, E. D.
Unguentum Sambuci, L. D.

Sambucus Ebulus.

Besides the *nigra*, there is another species, the Sambucus *Ebulus*, Dwarf Elder, or Danewort, which is not uncommon throughout Europe, in waste places, and by the sides of hedges; occasionally occurring in Great Britain, and flowering in July. It grows in many places near London, and is figured in "*English Botany*," *v.* 7, *t.* 475. It may be readily distinguished from the other species, by its low annual, herbaceous stem, leafy stipules, cymes with three principal branches, and its beautiful, dull purplish, or lilac-coloured flowers. The whole plant, with the exception of the flowers, has a nauseous, acrid, bitter taste, and a disagreeable smell. Every part of the plant, especially the bark, is violently cathartic, and sometimes emetic; being stronger and more unpleasant than the common elder. The berries are likewise purgative, but in a lesser degree. A syrup prepared from them has been given to the quantity of an ounce, as a laxative; in smaller doses, it is said by Haller, to be used in Switzerland as a deobstruent in chronic diseases. By some, the Sambucus *Ebulus* has even been regarded as an acrid poison.



Rhododendron chrysanthum.

Weddell Print

LXXX

RHODODENDRON CHRYSANTHUM.

Golden-flowered Rhododendron.

Class X. Decandria.—*Order* I. Monogynia.

Nat. Ord. Bicornes, *Lin.* Rhododendra, *Juss.* Ericineæ, *Desv.* Ericinæ, Ericaceæ, *Burn.*

Gen. Char. *Calyx* 5-parted. *Corolla* nearly funnel-shaped. *Stamens* declined. *Capsule* 5-celled.

Spec. Char. *Stem* decumbent. *Leaves* ovate, oblong, rugged above; paler or ferruginous, and smooth beneath. *Umbels* terminal. *Corolla* irregular, nearly wheel-shaped.

Syn.—Andromeda foliis ovatis, *Gmel. Flor. Sib. v.* 4. *p.* 121. *t.* 54.
Rhododendron officinale, *Salisb. Prodr. t.* 80.
Rhododendron chrysanthum, *Willd. v.* 2. 603; *Woodv. v.* 3. 403. *t.* 149; *Stokes, v.* 2. 504; *Pallas Fl. Ross. tom.* i. *pars* 1. *p.* 44. *t.* 30.

Foreign.—*Rosage*, Fr.; *Rhododendro aureo*, It.; *Gichtrose, Gelder Alpbalsam, Alprosen*, Ger.; *Roogelar*, Dut; *Pjanishnitz*, Russ.; *Schei*, Tart.

This beautiful shrub is a native of the mountains of Siberia, Kamtschatka, and Behring's Island, flowering in June and July, and ripening its fruit in September. It was introduced by Mr. Joseph Bush, in 1796, into our gardens, where it flowers, though rarely, in the middle of summer. In its native climes, it grows not only on the mountain tops, but on the banks of rivers.

The stem in alpine situations seldom exceeds a foot in height; in lower ground it grows to a foot and a half, sending off numerous decumbent spreading branches, having their ends emerging from the moss, and which are covered with a brown bark. The leaves are terminal, few, ovate, oblong, of a coriaceous texture, and attenuated towards the footstalk; the upper ones are reticulated, rugged, and of a deep green colour; the under pale or sub-ferruginous, very smooth, having the margin entire and bent

inward. The flowers are large, yellow, and placed alternately at the ends of the branches on very long peduncles, forming sertula or simple umbels. They are usually six or fewer, but sometimes about ten, erect and hairy. The calyx is inferior, persistent, and divided into five deep teeth; the corolla is pentasynpetalous, nearly wheel-shaped, and divided into five rounded, nearly equal, spreading segments, the three upper ones being only a little larger than the other two, striated towards the tube with livid dots; the lower ones unspotted. The stamens are ten, equal, thread-shaped, declining, with incumbent, oblong anthers. The germen is pentagonal, bearing a long slender style, and terminated by a 5-lobed stigma. The testa adheres firmly to the nucleus; the albumen is fleshy, the embryo cylindrical, in the axis of the albumen, and the radicle opposite the hilum. The capsule is ovate, somewhat angular, slightly curved, subtomentose, and divided into five or ten cells, which contain many small gray, irregular seeds, like saw-dust. Figs. (*a* and *b*) represent the capsule and its valves; (*c*) a section of the same to show the cells.

Professor Pallas was the discoverer of this plant during his tour through Siberia; and from his splendid work, (Flora Rossica,) we have taken our characteristic figure. The inhabitants of Siberia call the shrub Schéi or tea; and drink a weak infusion of it as a refreshing beverage, in the same way as we do that of the Chinese plant.

It appears from Pallas' account, that the Cossacks gather its leaves in September, when the capsules are ripe; but it is then less bitter than when in flower, and the whole plant is more flourishing; at which time he recommends it to be obtained for medicinal use.

Qualities.—The leaves smell, when fresh, something like rhubarb; when dried they are inodorous, but have an austere, bitterish taste, slightly resembling our common oak leaf. The decoction has a disagreeable odour, and a rough, bitter, acrid taste.

Medical Properties and Uses.—This plant was first used as a narcotic and astringent application for hæmorrhoidal fluxes; but it was not till Gmelin and Steller had lauded its virtues, that it excited the notice of the medical world. It ap-

pears that the Siberians, on the banks of the river Lena, when overcome by fatigue and cold, apply a decoction of its leaves to their limbs, to relieve pain and induce sleep. They also exhibit it for rheumatic and other painful affections of the muscles and joints, in the following manner: they take about two drachms of the dried shrub, stalks, and leaves, which, with nine or ten ounces of boiling water, they put into an earthen pot; lute on the head, and place it in an oven during the night. This infusion, *for it is not allowed to boil*, is drank the next morning for a dose. It occasions heat, together with a degree of intoxication, resembling the effects of spirituous liquors, and a singular kind of uneasy sensation in the limbs affected, accompanied by creeping sensations, which are likewise confined to the diseased parts. The patient is not permitted to quench the thirst which the medicine occasions; as fluids, particularly cold water, produce vomiting, whereby the power of the specific is lessened. In a few hours, all disagreeable effects disappear, commonly with two or three alvine evacuations. The patient then finds himself greatly relieved of his disorder, and has seldom occasion to repeat the medicine above two or three times to complete a cure.

From experiments which have been instituted in this country, the yellow Rhododendron appears to exert a stimulant, and diaphoretic effect; and as far as our experience goes, it supports the correctness of Dr. Home's remarks, who states that it has a power on the heart, whereby arterial action is often much diminished. In one case he mentions that the pulse was reduced to thirty-eight beats, although immediately after its administration excitement was brought on, which was followed by a proportionate diminution in the arterial action. Pallas relates in his travels, that it is a common and successful remedy among some of the Tartar tribes in gout, and other painful disorders. They drink till it brings on some degree of vertigo, and symptoms of intoxication, which effects are generally accompanied by a tingling sensation in the parts affected, and an abatement of pain. These effects were also noticed by Kœlpin, a friend of Professor Pallas, who not only speaks of its efficacy on himself, but in a tract, written in German and published at Berlin, extols it for its virtues in relieving gout and rheumatism, and likewise for

its valuable powers over that painful affection of the bones, known as venereal rheumatism.

Sometimes it excites head-ache, nausea, vomiting, delirium, and other unpleasant symptoms. Capriolus, a companion of Steller, having eaten ten leaves, soon after began to stagger, toss his head about, and to reel. After a short time, he fell on his knees, in vain attempting to rise; and although milk was copiously administered to him, he became overcome with sleep for an hour and a quarter, during which time he started continually, and appeared terrified. When he awoke he appeared as cheerful as before, and it failed afterwards to produce the same effects. After this, the servants of Steller were constantly taking small quantities of it, on account of its pleasant intoxicating effects.*

When we administer it, we put half an ounce of its leaves in twelve ounces of water, and allow them to *simmer only*, for four hours. Of the strained liquor, a quarter may be given to an adult every four hours; who, during its administration, must remain in bed, and its effects should be closely watched. The leaves of a different species, probably the R. *Caucasicum*, have been, for several years, sold by druggists for this plant; but Mr. Butler, of Covent Garden, has obtained a considerable quantity of the genuine drug from Siberia; and in those constitutions with which colchicum disagrees, we venture to recommend it as a very efficacious remedy.

R. *Caucasicum* is a native of the higher rocks of Caucasus, growing at very great elevations, and nearly approaching the confines of perpetual snow. Other species as R. *Kamtschaticum*, *Ponticum*, *Dauricum*, *ferrugineum*, and *hirsutum*, abound in both Europe and Asia: the two latter are common on the high mountains of Switzerland, Austria, Savoy, Piedmont and Dauphiny, closing the scanty vegetation of those elevated regions, and affording the shepherds their only fruit. The grouse are said to feed upon them, and the white hares will sometimes gnaw their bark in severe seasons; but animals do not seem to be fond of them, or to resort to them, except when compelled by the want of other food: they are even said to be in some measure deleterious.

* Pallas, Flora Rossica, fol. 45.



Swietenia febrifuga.

Weddell del.

LXXXI

SWIETENIA FEBRIFUGA.

Febrifuge Mahogany-tree.

Class X. Decandria.—*Order* I. Monogynia.

Nat. Ord. Trihilatæ, *Lin.* Meliæ, *Juss.* Cedreleæ, *R. Br.*, Meliaceæ Cedreleæ, *De Cand.* Cedrelidæ, *Burn.*

Gen. Char. *Calyx* 5-cleft. *Petals* five, exserted from the torus. *Stamens* 8—10. *Capsules* 5-celled, 5-valved, and woody. *Seeds* numerous, on each side of the dissepiment and winged.

Spec. Char. *Leaves* pinnate, in about four pair, of elliptical, roundish leaflets, unequal at the base. *Panicle* terminal, divaricated.

Syn.—Swietenia Soymida, *Duncan Tent. Inaug. de Swietenia, Ed.* 1794.
Soymida of the Telingas.
Swietenia febrifuga, *Sp. Pl.*; *Willd.* 2. 557; *Roxburgh. Coromand. Plants,* 1. *p.* 16. *t.* 17.

This plant is a native of the East Indies, growing in the mountainous parts of the Rajahmundry Circar, north of Samulcotah, and Peddapore. The tree was first brought to the notice of European practitioners by Dr. Roxburgh, who discovered that its bark was a valuable astringent and tonic in intermittent fever. It is cultivated with three other species in the botanical garden at Calcutta. The Telingas call it *Soymida*, but on the Coromandel Coast it is commonly known under the name of *red-wood* tree, which its Tamool name implies. It flowers about the end of the cold, or beginning of the hot season, and ripens its seeds three or four months after.

The Febrifuge Mahogany is a lofty tree, with a straight trunk of great thickness, and covered with a gray, scabrous, cracked

bark. The branches are numerous; the lower ones spreading, the upper ascending, forming a very large shady head. The leaves are alternate and abruptly pinnate, about a foot long, composed of three or four pairs of opposite, petioled, oval, obtuse or emarginated leaflets; each from three to five inches long and from two to three broad, smooth, shining, the lower side extending a little further down the petioles than the upper side, and of a bright green colour. The flowers are very numerous, middle-sized, white, and inodorous; and disposed in racemes which rise from the axillæ of the upper degenerate leaves, and hence may form very large, terminal, diffuse panicles, furnished with small bracteas. The calyx is inferior, synsepalous, 5-cleft, oval, deciduous; the nectary formed by the union of the lower part of the filaments is scarcely half the length of the petals, and bellied. The petals are five, obovate, obtuse, concave, and expanding. The filaments are ten, very short, inserted just within the mouth of the staminiferous tube. The germen is conical, surmounted by a thick tapering style, crowned with a large targetted stigma, shutting up the mouth of the nectary. The capsule is large, ovate, and 5-valved, with the valves gaping from the top. The receptacle in the centre, is large, spongy, and 5-angled; the angles being sharp, and connected with the sutures of the capsule. The seeds are many in each cell, imbricated, obliquely wedge-shaped, and enlarged by a long membranaceous wing, inserted into a brown speck, on the upper part of the excavations of the receptacle. The albumen is fleshy, the embryo straight, and the cotyledons flat and foliaceous. Fig. (*a*) represents the germen in outline magnified; (*b*) the capsule.

The generic name, Swietenia, was given to this tree by Jacquin, in honour of the celebrated Baron Van Swieten, first physician to Maria Theresa of Germany, author of some botanical tracts, and well known by his voluminous Commentaries on Boerhaave's Lectures.

The wood of this tree is of a dull red colour, remarkably hard and heavy: it is reckoned by the natives the most durable timber with which they are acquainted: on that account it is used in the building of their temples, and for various other useful pur-

poses. The wood of another species of this genus, the common Mahogany, (*Swietenia Mahogoni*,) a native of South America and the West India islands, has an aromatic, agreeable smell; its excellency for domestic purposes is well known in England, and its bark has been said to possess similar medicinal powers to the S. *febrifuga*.

Qualities.—The bark is brittle, compact, of a light red colour internally; externally it is covered with a rough grey epidermis. Its taste is very bitter and astringent, at the same time not in any way nauseous or disagreeable; it yields its virtues to water both by infusion and decoction, and forms an admirable tincture prepared after the same way as the Tinctura Cinchonæ. The wood yields an extract very similar to Kino, but it is bitter and less astringent.

Medical Properties and Uses.—This bark, which was first recommended as a tonic by Dr. Roxburgh, has excited little attention amongst European practitioners, but in India it is highly prized by our army-surgeons, who use it in all those cases which have been usually benefited by Cinchona. Mr. Breton, who published a paper on it, in the eleventh volume of the Medico-Chirurgical Transactions, says, "In a number of cases of confirmed remittent bilious fevers, (commonly called jungle fever,) I have put this bark to the fairest possible test, and as success was uniformly the result of my repeated trials, I think I am warranted in concluding it to be an efficient substitute for the Peruvian bark. In common intermittent fevers, I have employed this bark very extensively, and with invariable success. I have also put this drug to the test of trial in three cases of grangrene and mortification, and in a case of suppurated liver; but as it was accompanied with auxiliaries, I cannot speak so positively of its actual efficacy in these instances. The uniform result, however, of so many experiments, satisfied my own mind, that the Swietenia *febrifuga* answers every purpose of Peruvian bark, in allaying irritability, and restoring strength. I trust I shall not be accused of being visionary or enthusiastic, when I avow my own conviction, after having long employed this bark in every case where Cinchona is indicated,

that it forms a completely efficient substitute for the American drug; and that time alone is required to extend the general conviction of its efficacy, which every succeeding experiment will assuredly impress."

In a letter from Dr. Roxburgh, which accompanies Mr. Breton's paper, he states his continued belief in its efficacy, and recommends the bark to be collected when the sap begins to ascend freely, at which period it separates readily. He also believes the small, or rather middling-sized branches, to yield the bark best suited for medical purposes; and it may be used as soon as it is dry enough for powdering. Messrs. Cochrane, Cheese, Grant and Davidson, &c. have tried it very extensively in India, and confirm all that has been advanced in its favour; and they seem to agree in its being better retained in the stomach when in substance, and in greater quantities, than Cinchona usually is. Dr. Ainslie also recommends it to the extent of four or five drachms in the twenty-four hours, as a very efficacious medicine; but beyond that quantity, in every instance in which he tried it, it appeared to derange the nervous system, occasioning vertigo and subsequent stupor.

Doses.—Its dose in substance is from one to four, five, and six drachms a day. Both the tincture and infusion may be prepared in the manner recommended for Cinchona, and may be given in the same way.



R. acris *Ranunculus Flammula*

LXXXII

RANUNCULUS ACRIS.

Upright Meadow Crowfoot.

Class XIII. POLYANDRIA.—*Order* VII. POLYGYNIA.

Nat. Ord. MULTISILIQUÆ, *Lin.* RANUNCULACEÆ, *Juss.*

GEN. CHAR. *Calyx* 5-leaved. *Petals* 5 or more, with glandular *nectaries* in their claws. Pericarps not gibbous at the base, pointed and arranged in globose or cylindrical heads.

SPEC. CHAR. *Calyx* spreading. *Flower-stalks* round. *Leaves* in three deep-lobed and cut segments; the upper ones linear and entire. *Stem* erect.

Syn.—Ranunculus pratensis erectus acris, *Bauh. Pin.* 178; *Raii Syn.* 248.
Ranunculus surrectis cauliculis, *Ger. Em.* 951.
Ranunculus pratensis, surrectis cauliculis, *Lob. Ic.* 665. *f.*
Ranunculus hortensis secunda, *Dod. Pempt.* 426. *f.*
Ranunculus, *n.* 1169. *Hall. Hist. v.* 2. 72.
Pes corvinus, *Brunf. Herb. v.* 1. 143. *t.* 38. *f.* 3.
Chrysanthemum, *Fuchs Hist.* 879. *f.*
Ranunculus acris, *Lin. Sp. Pl.* 779; *Willd. v.* 2. 1326; *Fl. Brit.* 593; *Eng. Bot. v.* 10. *t.* 652; *Curt. Lond. fasc.* 1. *t.* 39; *Mart. Rust. t.* 30; *Hook. Scot.* 174; *Stokes, Bot. Mat. Med. v.* 3. 266; *Bull. Fr. t.* 109.

AMONG the numerous species of vegetables, natives of Britain, few are more familiarly known than those of the Ranunculi. They are herbaceous plants, all, or at least most of them, possessing acrid qualities, and generally affecting cold or temperate climates. Sixty-one species are enumerated by Willdenow in the 14th edition of Systema Vegetabilium, but the number has of late been considerably augmented, and now nearly two hundred are known. Fifteen are natives of our island; and of these the two species figured, and the *bulbosus* are the most common, occupying a considerable space in rich pastures, and propagating themselves with great facility. Early in the spring, and during the greater part of the summer, the flowers occur everywhere; hence the farmer and the horticulturist are continually employed in their destruction, for they contribute little or nothing to the support of man and the larger quadrupeds.

The root of the Ranunculus *acris*, is perennial and somewhat bulbous, with several long simple fibres. The stem is two feet high, erect, round, hollow, leafy, beset with minute hairs, branched towards the top, and many-flowered. The radical leaves are oblong, upright, hairy, footstalks, in three or five deep lobes, which are variously subdivided and toothed. The leaves on the stem are of the same structure; divided into fewer and narrower segments; the uppermost are much smaller, and cut into three linear entire lobes, or sometimes entirely simple and linear. The stalk and branches are terminated by bright yellow flowers, one or two together on round even stalks, covered with close hairs, and *not* furrowed. The calyx is pale greenish-yellow, or coloured like the corolla, and formed of five ovate, concave, spreading deciduous leaves, which are clothed with a downy pubescence and tipped at the apex with a dark brown spot. Within the calyx are five obtuse petals, polished on their inner surface, and furnished at the base with the nectary, which is a small pore, covered by a scale. The filaments are numerous, (from forty-eight to ninety-three,) not half the length of the petals, with oblong heart-shaped stigmas. In the centre of the corolla are many germens, collected into a head, and each furnished with a small reflected stigma. The akenia are lenticular, smooth, with a small, slightly curved point. Fig. (*a*) represents a single petal detached to show the nectary; (*b*) a stamen with its anther.

Linneus gave this species the name Acris, on account of its being supposed to be acrid and poisonous in an eminent degree. Mr. Curtis says, "that even pulling up the plant, and carrying it some little distance, has produced a considerable inflammation in the palm of the hand; that cattle in general will not eat it, but that sometimes, when they are turned in a hungry state into a new field of grass, or have but a small spot to range in, they will feed on it, whereby their mouths become sore and blistered. According to Linneus, sheep and goats eat it; but kine, horses, and swine refuse it. When made into hay it loses its acrid quality; but then it seems to be too stalky and hard to afford much nourishment; if it be of use, it must be to correct, by its warmth, the insipidity of the grasses." It has been supposed to act as a condiment, and hence to be serviceable when taken in moderate quantities along with other more bland and nutritious herbs.

RANUNCULUS FLAMMULA.

Lesser Spear-wort Crowfoot.

(*Pl.* LXXXII.)

SPEC. CHAR. *Leaves* ovate-lanceolate, bluntish, stalked. *Stem* reclining. *Root* fibrous. Akenia smooth.

Syn.—Ranunculus flammeus minor, *Raii Syn.* 250; *Ger. Em.* 961. *f.*
Ranunculus longifolius, aliis Flammula, *Bauh. Hist. v.* 3. 848. *f.*
Ranunculus, *n.* 1182. *Hall. Hist. v.* 2. 78.
Ranunculus Flammula, *Lin. Sp. Pl.* 772; *Willd. v.* 2. 1307; *Fl. Brit.* 587; *Eng. Bot. v.* 6. *t.* 387; *Curt. Lond. fasc.* 6. *t.* 37; *Hook. Scot.* 174; *Stokes, Bot. Mat. Med. v.* 3. 258; *Bull. Fr. t.* 15.

THIS species of Ranunculus, which is commonly called in English the small or lesser Spear-wort, grows plentifully throughout Europe, in marshy places, and especially in the wet and more boggy parts of heaths and commons, where it flowers during most part of the summer.

The root is perennial, consisting of several long simple fibres, issuing from the lower joints of the stem. The stem is a foot high or more often reclining partly, or entirely decumbent at the base, branched, leafy, round, hollow, smooth, and frequently tinged with purple. The whole plant is generally smooth, except a variety whose leaves are said to be hairy at the edges, and the upper part of the stem is sometimes a little downy. The radical leaves are ovate-lanceolate, pointed at each end, standing on long foot-stalks, which are hollow on one side and flattened; those on the stalk lanceolate, alternate, standing on shorter foot-stalks, which are dilated and sheathing at the base; the uppermost, and those next the flowers, linear; all of them smooth, sometimes perfectly entire, or more or less toothed. The flowers are terminal as well as opposite to the leaves, and stand on round erect stalks, without bracteas. The corolla is of a bright yellow colour. composed of five roundish, somewhat concave, heart-shaped petals, with short claws and a very minute

nectary. The calyx consists of five ovate, obtuse, slightly villous, concave, yellowish, deciduous leaves. The stamens are numerous, and the other parts of the flower resemble those of the preceding species. Mr. Lightfoot remarks that the plant, in some states, differs very little from great Spear-wort Crowfoot, Ranunculus *Lingua*; that varies greatly in magnitude, and in gravelly soils degenerate to a trailing dwarfish size, with small linear leaves.

GENERAL QUALITIES OF THE RANUNCULI.

The roots of the R. *bulbosus* appear to consist of albumen, mixed with ligneous fibre. If the root be macerated in cold water, it gives a solution of this substance, which coagulates in floccules on the application of heat; and undergoes the same process slowly on the admixture of alcohol. The juice of some yield nitric acid; but the most interesting constituent in most of the species of ranunculus is the acrid principle, which pervades every part of the plant in its green state. Like the acrimony of the arum, it is volatile, and disappears in drying, or upon the application of heat. It differs, however, in not being destroyed by a moderate heat, and in being fully preserved by distillation. Professor Bigelow subjected various species of this family to this experiment, and always found the distilled water to possess a strong acrimony: while the decoction, and portions of the plant remaining in the retort, were wholly destitute of this property. This distilled water, when first taken into the mouth, excited no particular effect; but after a few seconds, a sharp, stinging sensation was produced. When swallowed, a great sense of heat took place in the stomach. Some distilled water of the *R. repens*, was kept in a close-stopped phial for several months, and retained its acrimony undiminished. In winter time it froze, and on thawing lost this property. According to the experiments of Tilebein,* the water of *R. sceleratus* is acrimonious in an intense degree; and when cold, deposits crystals, which are scarcely soluble in any menstruum, and are of an inflammable nature. Precipitates are pro-

* Chemical Annals, vol. ii. p. 313.

duced in this water by muriate of tin, and acetate of lead. The strength of the distilled water is impaired by continuing the operation too long. The acrimony of the plant is also expended in a very short time at the boiling heat, and a further continuance of the distillation brings over only water.

Properties and Medical Uses, &c.—Both ancient and modern writers on botany, and materia medica, agree in attributing to many species of the genus *Ranunculus* a corrosive and poisonous quality. In several, it abounds in such a degree as, when applied externally, in a recent state, to excite vesications, and ulceration of the parts, which often assume a malignant or gangrenous disposition; and taken internally they prove poisonous, by inducing vomiting, inflammation of the stomach, and the usual consequences of acrid poisons. These qualities, according to Dr. Pulteney,* are particularly manifest in the recent plant, while in its highest vigour before flowering; and more intensely in the germen of the flower itself, and in the petals of some.

The poisonous species that are indigenous and common in England, are the R. *Flammula;* R. *bulbosus;* R. *acris;* R. *sceleratus;* and the R. *arvensis.* Of these the *Flammula*, *bulbosus* and *sceleratus*, are judged to be the most acrimonious.

Before the introduction of *Cantharides*, the acrid Ranunculi were all, in their turn, used as vesicatories, and Haller† tells us, that the R. *flammula* is still in use as such in some parts of France: and as the two species we have figured have obtained places in the materia medica of the Dublin college, we suppose they are intended to be employed for this purpose amongst the paupers of Ireland. Gilibert‡ assures us, that the *R. bulbosus* vesicates with less pain than the Spanish *flies*, and has this advantage, that it does not affect the urinary passages. He therefore gives it a decided preference as an epispastic. Other authors allow these properties in the Ranunculi; and state that they exert their effects sooner than the Cantharides; but as their action

* Trans. of Lin. Soc. vol. v. p. 14.
† See his Enumeratio Stirpium, and Hist. Stirp. Helvetiæ.
‡ Plantæ rariores Lithuaniæ, No. 331.

is uncertain, and as many instances are recorded by Murray* and others, of their producing ill-conditioned ulcers, they are not employed in this country. The latter author states, that a slice of the fresh root of *R. bulbosus* placed in contact with the inside of the finger, brought on a sense of pain in two minutes. When taken off, the skin was found without redness, and the sense of heat and itching ceased. In two hours, however, it returned again, and in ten hours a full serous blister was raised. This was followed by an ulcer of bad character, and difficult to heal. He remarks, that if the application is continued after the first itching, the pain, and subsequent erosion are much greater. And it is a well-known fact, that soldiers, and mendicants, often resort to these plants to produce ulcers on their legs; the former to procure their discharge, and the latter to excite commiseration.

With a view to their external stimulation they have been used advantageously in rheumatism, in hip disease, hemicrania, and fixed pains of various descriptions. Amongst the old practitioners who have recorded instances of their effects, are Baglivi, Störk, and Sennertius. A curious practice formerly prevailed in several countries of Europe, of applying the ranunculus to the wrists, or fingers, for the cure of intermittent fevers. This is mentioned by Van Swieten, Tissot, and some others. In *hemicrania* it was applied to the head, and in this case did not produce a discharge, nor break the skin; but occasioned tumefaction of the hairy scalp. Chesnau, quoted by Murray, advises that the ranunculus be applied to a small surface only, and through a perforation of adhesive plaster, to keep it from spreading. From want of this caution, he had known extensive inflammation to arise, and spread over a great part of the face, neck, and breast.

The burning sensation which the Ranunculi excite in the mouth when chewed, extends, as we have already observed to the stomach, if they are swallowed. Krapf† states, that a small portion of a leaf, or flower of R. *sceleratus*, or two drops of the juice, excited acute pain in the stomach, and a sense of inflammation in the throat. He gave a quantity of the juice

* Appar. Med. iii. 87.

† Experimenta de nonnullorum Ranunculorum, &c. p. 107.

to a dog, which produced vomiting and great distress: and the animal being killed, was found to have the stomach inflamed, and contracted, and the pylorus hardly pervious. The same author informs us, that dilution greatly diminishes the power of this fluid, so that half a drachm of the juice, in six ounces of water, may be taken with entire safety. Grazing cattle generally avoid the plants of this genus, as far as it is possible for them to do so. Accordingly, we observe the flowers of ranunculi left untouched, while the grass is closely cropped around them. It is nevertheless unavoidable, that portions of them should often be eaten by these animals; and although their mouths and nostrils are frequently excoriated, it is probable that small quantities of the less acrid sorts do them little injury. In the *Pan Suecicus*, some experiments upon these plants, on domestic animals, are detailed; in which it it is stated, that horned cattle eat all the species when offered to them, excepting R. *auricomus*. This species was rejected by horses, while they would eat R. *Flammula*. Sheep and goats eat the R. *acris*, one of the most pungent of the species. Dr. Pulteney states it as a well-known fact, that hogs devour the root of R. *bulbosus*. How it is that these animals resist the deleterious effects of such virulent plants it is not easy to say. It is not, however, a more remarkable fact, than that which is mentioned by Professor Pallas, that the hedgehog can devour cantharides by hundreds without inconvenience, whereas one of these insects might cause very serious symptoms in man. In their dry state, various species of ranunculi must necessarily enter very largely into the composition of hay; but having lost their acrimony by drying, they become harmless, and probably nutritive. Dr. Pulteney, in his paper already cited, states, that "in the neighbourhood of Ringwood, on the borders of the Avon, which affords the *Ranunculus aquatilis fluvialis* in great abundance all the year, some of the cottagers sustain their cows, and even horses, almost wholly by it. It is usual to employ a man to collect a quantity for the day every morning, and bring it in a boat to the edge of the water, from which the cows eat it with great avidity. I was indeed informed they relish it so highly, that it is unsafe to allow them more than a certain

quantity—I think between twenty-five and thirty pounds each daily; but with variations according to circumstances. The cows I saw were apparently not in a mean condition, and gave a sufficient quantity of good milk. I was told by the person, whose cattle were feeding on it, that he kept five cows and one horse so entirely by this plant, and what the heath afforded, that they had not consumed more than half a ton of hay throughout the whole year. I examined the heap on which four cows were feeding in the beginning of March; and found that it consisted exclusively of the *Ranunculus fluvialis*, without any mixture of other aquatic plants. In summer, however, it can scarcely be avoided but that there must be a mixture of some of these; but other plants are not chosen. Hogs also thrive so well on this Ranunculus, that they are not allowed any other food, till it is proper to fatten them."

The Ranunculus *Flammula* is very acrid. Applied externally it inflames and blisters the skin. Its acrimony rises in distillation. Some years ago a man travelled in several parts of England administering vomits, which operated the instant they were swallowed. The distilled water of this plant was his medicine; "and from the experience I have had of it," says Dr. Withering, "I feel myself authorized to assert, that in the case of poison being swallowed, or other circumstances occurring, in which it is desirable to make the patient vomit instantaneously, it is preferable to any other medicine yet known, and does not excite those painful contractions of the upper part of the stomach, which the white vitriol sometimes does, thereby defeating the intention for which it was given." The Highlanders raise blisters with it; for this purpose, the leaves are well bruised in a mortar, and applied in one or more limpet shells to the part where the blisters are to be raised.

Treatment.—The Ranunculi are too acrid to render it probable that they should ever be taken accidentally in sufficient quantity to produce deleterious effects; while, on the other hand, boiling them, if used by mistake for pot-herbs, dissipates their injurious properties. If, however, any accident should ever arise from them, we refer to Arum *maculatum*, Art. 22, for an account of the treatment which ought to be adopted.



Angelica Archangelica?

ANGELICA ARCHANGELICA,
vel
ARCHANGELICA OFFICINALIS.

Garden Angelica.

Class V. PENTANDRIA.—*Order* II. DIGYNIA.

Nat. Ord. UMBELLATÆ, *Lin.* UMBELLIFERÆ, *De Cand.* &c. ANGELICINÆ, ANGELICACEÆ, *Burn.*

GEN. CHAR. *Calyx* shortly 5-toothed. *Petals* elliptic, entire and acuminate; the *fruit* sub-compressed posteriorly, with a subcentral raphe, and two winged on each side; the channels with single vittæ, and the seed non-adherent.

SPEC. CHAR. *Leaves* bi-pinnated, with the terminal leaflet 3-lobed.

Syn.—Angelica, *Camer. Epit.* 899. *f.*; *Lob. Icon.* 698. *f.*; *Trag. Hist.* 421. *f.*
Angelica sativa, *Bauh. Pin.* 155; *Bauh. Hist. v.* 3. p. 3. *p.* 2. 148. *f.*; *Matth. Valgr. v.* 2. 513. *f.*; *Fuchs Hist.* 124. *f.*
Angelica, *n.* 807; *Hall. Hist. v.* 1. 358.
Angelica major, *Dod. Pempt.* 318, *f.*
Angelica Archangelica, *Lin. Sp. Pl.* 360; *Willd. v.* 1. 1428; *Fl. Brit.* 311; *Eng. Bot. v.* 36. *t.* 2561; *Woodv. t.* 50; *Stokes, v.* 2, *p.* 97.
FOREIGN.—*Angelique*, Fr.; *Angelica domestica*, It.; *Angelikawurzel*, Ger.

ANGELICA is either a native of this country or completely naturalized, being found growing naturally at Broadmoore, about seven miles north-west from Birmingham, and in the marshes, among reeds by the side of the Thames, between Woolwich and Plumstead; and at Lambeth, where, in the delightful gardens of Mr. Watson, who favoured us with the specimen from which the above figure has been taken, it grows most luxuriantly. It flowers from June to September.

The root is large, fleshy, branched, resinous, brown externally and white within. The stem is erect, four or five feet high, jointed, round, hollow, striated, smooth, of a purplish hue or somewhat glaucous at the lower part, and sends off numerous branches, which terminate in large globular many-rayed umbels. The foliage, stalks, and even the flowers, are all of a bright green. The leaves are numerous, very large, petiolated, smooth and pinnated with the leaflets ovate-lanceolate, pointed, cleft, acutely serrated, smooth, and having the terminal ones 3-lobed; the foot-stalks membranous at the base, tumid, with many ribs, and very much dilated. The general bracteas or involucres are few, linear, deciduous, often wanting; the partial ones, consisting of about eight linear-lanceolate leaves, occasionally enlarged, leafy and notched. The flowers are numerous, of a greenish-white colour, and grow in large terminal umbels, composed of several partial ones, both of which are nearly globose and many-rayed. The calyx has a small short 5-toothed margin, the corolla is small, and divided into five equal, elliptic, lanceolate, petals, with the points turned inward; the stamens thread-shaped, spreading, longer than the corolla, with roundish anthers; the germen is inferior, ovate, furrowed, supporting two very short, erect, and subsequently recurved styles, with obtuse stigmas. The fruit is a cremocarpium, each mericarp flat on one side, convex on the other, with four acute ribs, emarginate at both ends, and containing a single brown, ovate, pointed seed. Fig. (*a*) represents a flower somewhat magnified; (*b*) the fruit; (*c*) a seed.

Bohemia and Spain are said to produce the best Angelica. The college formerly directed the Spanish only to be kept in the shops. Linneus, however, avers that the plant is most vigorous on its native northern mountains, and gives a decided preference to the root dug here, either early in the spring, or late in autumn. This plant, and the Acorus *Calamus*, are almost the only aromatics of European growth; the former is decidedly more pleasant, and is very undeservedly neglected in modern practice.

Qualities.—The roots are the parts used, and they possess a fragrant, agreeable smell, and a bitterish pungent taste; on being chewed, they are first sweetish, afterwards acrid, and leave a

glowing heat in the mouth and fauces, which continues for some time. The stalks, leaves, and seeds, possess the same qualities in a lesser degree. Dr. Lewis says that on wounding the fresh root early in the spring, it yields from the inner part of the bark an unctuous, yellowish, odorous juice, which, gently exsiccated, retains its fragrance, and proves an elegant, aromatic, gum resin. Rectified spirit extracts the whole of the virtues of the root; water but very little; and by distillation in the latter, a small portion of very pungent oil is obtained. Cows, goats, and swine eat it, but horses refuse it.

Propagation and Culture.—It delights in moist situations on the banks of running water, but will grow freely in every soil and exposure. The plants are raised from seed; and for a bed four feet and a half by six feet, sown in drills a foot apart, to be transplanted, half an ounce of seed will be requisite. "Sow in August, or as soon as the seed is ripe, as the plants will come up earlier and stronger than from a sowing in the spring. When the plants are advanced from four to six inches high, transplant them into rows two feet apart. They will soon strike root, and advance quickly in strong growth. In the second year, their strong erect branchy stalks will be several feet high, producing large umbels of seed, ripening in autumn, which, as well as the leaves of the plant, are used in medicine. But, for candying, the young shoots of the stems, and stalks of the leaves, are the useful parts; being cut, while green and tender, in May and June, they are made by confectioners into the sweetmeat called Angelica. In the second year, if seed is not wanted, cut the plants down in May, and the stool will send out side-shoots; by repeating this practice every year, the same plant may be long continued. Cuttings will also grow."—*Abercrombie.*

Medical Properties and Uses.—The Laplanders extol it not only as food, but as a medicine. For coughs, hoarseness, and other pectoral disorders, they eat the stalks roasted in hot ashes: they also boil the tender flowers in milk, till it attains the consistence of extract, which they use to promote perspiration in catarrhal fevers, and to strengthen the stomach and bowels in diarrhœa. The leaves, seeds, and root are certainly good aromatic tonics, and may be given three or four times a day, in doses of two scruples, or a drachm. An agreeable sweetmeat is made of the root by the confectioners of London, which is only surpassed by that of ginger.

The following passage from old Gerarde, if not instructive, is at least exceedingly entertaining:—

"The roote of Garden Angelica is a singular remedie against

poison, and against the plague, and all infections taken by euill and corrup aire, if you do but take a peece of the roote and holde it in your mouth, or chew the same between your teeth, it doth most certainly driue away the pestilentiall aire, yea, although that corrup aire have possessed the hart, yet it driueth it out againe by vrine and sweate, as Rice and Treacle doth, and such like *Antipharmaca*. Angelica is an enemie to poisons: it cureth pestilent diseases, if it be vsed in season; a dram waight of the powder hereof is given with thin wine, or, if a feauer be vehement, with the distilled water of *Carduus benedictus*, or of *Tormentill*, and with a little vineger, and by itselfe also, with Treacle of Vipers added. It openeth the liuer and spleene: draweth down the tearmes, driueth out or expelleth the secondine. The decoction of the roote made in wine is good against the cold shivering of agues. It is reported that the roote is auaileable against witchcraft, and inchantments, if a man carrie the same about him, as Fuchsius saith. It extennuateth and maketh thinne grosse and tough flegme: the roote being vsed greene, and while it is full of iuice, helpeth them that is asthmatake, dissoluing and expectorating the stuffings therein, by cutting out and clensing the parts affected, reducing the bodie to health againe; but when it is dry, it worketh not so effectually. It is a most singular medicine against surfeiting and lothsomnes to meate; it helpeth concoction in the stomacke, and is right beneficial to the hart: it cureth the bitings of mad dogs, and all other venemous beasts. The wild kinds are not of such force in working, albeit they haue the same vertues attributed unto them."*

* The Herball, or Generall Historie of Plantes, gathered by John Gerarde of London, Master in Chirurgerie. p. 849. fol. Lond. 1597.



Melaleuca Cajuputi.

Weddell fecit

MELALEUCA CAJEPUTI.

Lesser Cajeput Tree.

Class XVIII. POLYADELPHIA.—*Order* IV. POLYANDRIA.

Nat. Ord. HESPERIDEÆ, *Lin.* MYRTI, *Juss.* MYRTACEÆ, *De Cand.* MYRTINÆ, MYRTACEÆ, *Burn.*

GEN. Char. *Calyx* 5-parted, semi-superior. *Corolla* 5-petaled. *Stamens* (about 40) very long, conjoined in five bodies. *Style* single. *Capsule* 3-celled. *Seeds* numerous.

SPEC. CHAR. *Branchlets* pendulous. *Leaves* alternate, short-petioled, narrow-lanceolate, 3 and 5-ribbed, *Spikes* terminal and axillary, comose, villous. *Bracteas* lanceolate, 3-flowered.

Syn.—Arbor alba minor, *Rumph. Amb. v.* 2. 76. *t.* 17.
Melaleuca Cajeputi, *Pharm. Lond.* 1809; *Trans. Med. Bot. Soc. n.* 1. 27. *t.* 1.
Cajeputi, Daun-Kitzjil, and *Kaju-Kilau* of the Malays.

THIS elegant and useful tree, which affords from its leaves, by distillation, the fragrant essential oil, known in the shops under the name of Oleum Cajeputi, is a native of the Molucca Islands. This oil was long supposed to be the produce of the Melaleuca *Leucadendron* only; but it appears, from specimens of the plant sent home by Mr. Christopher Smith, that the species which affords it most abundantly, if not entirely, is a different one, and that it agrees with the *Arbor alba minor* of Rumphius's Herbarium Amboinense. (vol. ii. t. 17. fig. 1.) Drs. Maton, and Smith, have fixed it as a new species under the name of M. *Cajeputi.*

The following description of the Melaleuca *Cajeputi* was furnished by Thomas Henry Colebrooke, Esq. F. R. S., a practical and accomplished botanist, from the MS. of Dr. Roxburgh ; and the same gentleman has communicated to the Medico-Botanical Society of London, the drawing of that plant, made under the direction of Dr. Roxburgh, from which our engraving is taken.

As, says Mr. Colebrooke, it is from the leaves of this plant that the valuable medicine called Cajeput Oil is obtained, "it became an object of importance to try if it would grow in Bengal, where the medicine is frequently used with the best success. During my absence at the Cape of Good Hope, on account of bad health, in 1798, Dr. John Fleming had charge of the Botanic Garden. At the same time Mr. Smith, the nurseryman, was employed on the Molucca islands, collecting plants for the garden, consequently an excellent opportunity offered for obtaining growing specimens of the tree. Dr. Fleming, therefore, gave Mr. Smith strict orders to be very careful to get the proper sort, (two or three being mentioned by Rumphius,) from which the best oil was obtained. This commission Mr. Smith executed to our satisfaction ; many thriving plants having been sent to the garden by the close of the year, where they continued to grow freely : and in six or seven years they began to blossom at various times of the year, which they have hitherto continued to do. From them numerous plants have been reared, and not only distributed over many parts of the continent of India, but sent to various other quarters of the world. It is from the original young trees, now (1811) thirteen years old, that the following description and the accompanying figure is taken."

The trunk is tolerably erect, and covered with a very light or whitish ash-coloured, soft, thick, smooth, spongy bark, the external lamina of which peels off from time to time like the birch-tree. The branches bear scattered slender twigs, often drooping as completely as in the weeping willow ; they are round and smooth, the *young shoots* being sericeous. The leaves are alternate, on short petioles, not unlike those of the willow, from three to five inches long, and from half to three quarters

of an inch broad, lanceolate, and while young sericeous; when full grown, smooth, deep green, three to five nerved, and sometimes slightly falcate. On being bruised, they smell strongly of the substance they yield, yet the cells which contain this aromatic fluid are scarcely visible in the fresh leaves. The spikes are terminal, and from the extreme axils, downy; while in the young plants there is only a scaly cone at the apex; which soon advances into a leafy branchlet. The flowers are small, white, sessile, inodorous, and accompanied by solitary, lanceolate, sericeous bracteas. The calyx is urceolate, sericeous, and divided at the margin into five semi-lunar deciduous segments. The petals are five, orbicular, short clawed, and much longer than the segments of the calyx. The filaments are from thirty to forty, united into five portions at the base, three or four times longer than the petals, and with them exserted from the large villous 5-lobed rim of the calyx, alternating with its segments: anthers ovato-cordate, with a yellow gland on the apex. The germen is ovate, crowned with a slender style longer than the stamens, and an obscurely 3-lobed stigma. The capsule is completely enveloped in the thick, fleshy, gibbous, permanent tube of the calyx, 3-lobed, 3-celled, and containing many small regularly wedge-shaped seeds.—Fig (*a*) represents a single petal with the filaments and anthers; (*b*) a section of a flower magnified; (*c* and *d*) the capsule and a seed.

Mr. Crawford, in his "History of the Indian Archipelago," states that there are three varieties of this tree, native to Amboyna, Java, and Borneo. The largest is a mountain tree, growing in continuous forests; and its bark yields the material with which the natives of the Moluccas calk their ships. The smaller, which yields the *kyápootie* or *Cajaputi oil*, thrives near the sea-coast, and has got its name from its colour, for *káyu-puti*, signifies *white wood;* and hence Rumphius gave it the name of "*arbor alba minor.*" "Besides its current name, it is known in Malay countries," says Dr. Ainslie, by other terms, as *galam. daun*, *kitsjil*, &c.; in Ternate, by *bajule;* in Amboyna, by *kilam*, *ilam*, and *elam;* and in Ceram by that of *sakelan.*

Qualities.—This oil (formerly called oleum Wittnebianum, from Wittnebin, who first gave an account of the process for obtaining it) is distilled from the leaves of this plant, and is ordinarily brought to Europe in copper vessels, that hold about three pints; and, as it is generally of a green colour, it has been supposed to acquire this tinge from the copper; but

after careful investigation, we have not been able to trace the smallest portion of that metal in it. Sometimes the oil is nearly white, clear, and very limpid. It has a strong volatile smell, resembling camphor and cardamoms mixed; and a strong pungent taste, like that of the latter. It is often adulterated; and when it is of a dark colour, and not perfectly soluble in alcohol, it should be rejected. A solution of camphor in oil of turpentine, tinged with verdigris, is often sold by fraudulent druggists for the genuine article. Leveköhn says, that Cajeput oil is a compound fluid, consisting of two different oils, one of which is green, and heavier than the ordinary fixed oils, while the other, which is very light and colourless, constitutes seven-eighths of the whole.

Medical Properties and Uses.—This oil appears to be a powerful medicine, and is much esteemed on the continent, as well as in the East Indies, as a general remedy in chronic and painful diseases. It is used for the same purposes for which we employ the officinal æthers, to which it appears to bear considerable affinity. It is, however, more active and pungent; for if five or six drops be taken, it heats and stimulates the whole system, and is a very certain diaphoretic; by which, probably, the good effects, it is said to have in dropsies and intermittent fevers, are to be explained. For its efficacy in various spasmodic and convulsive affections it has been much commended; and numerous instances of its successful employment are cited by Murray from various authors. It is said, that if a drop be rubbed on the temple, it will occasion a pungent pain in the eyes, and a discharge of tears; hence it has been used in chronic affections of the eyes, and is a powerful remedy for the relief of tooth-ache. It is, no doubt, a highly diffusible stimulant, antispasmodic, and diaphoretic; and may be efficaciously given in chronic rheumatism, palsy, hysteria, and flatulent colic; in doses of from two, to six, and eight drops on a lump of sugar; and when mixed with olive oil it forms a valuable stimulating embrocation.

Cajeput oil was one of the numerous remedies confidently recommended as efficacious in the cure of Indian Cholera, on the arrival of that disease in Britain. It was, consequently, much sought after, and its price in the markets rapidly advanced: its quality, however, at the same time, was reduced: whether it became impotent through adulteration, or whether virtues had been assumed for it which in truth it did not possess, is a question not absolutely decided, as fraud prevented a fair trial being given to it here; but it soon fell into disrepute, for as administered in cholera it was found to be as useless as most of the other means and medicines employed.

Its smell is supposed to keep off insects from collections of natural history; and as it dissolves *caoutchouc*, a good varnish may be obtained by their admixture.

Tab. 85.



Menyanthes trifoliata.

Weddell Fecit

MENYANTHES TRIFOLIATA.

Common Buckbean or Bog-bean. Marsh Trefoil.

Class V. PENTANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. Allied to Gentianæ, *Juss.*
GENTIANEÆ, *De Cand.* GENTIANACEÆ, *Burn.*

GEN. CHAR. *Calyx* 5-cleft. *Corolla* funnel-shaped, 5-lobed, equal, hairy within. *Stigma* 2-cleft. *Capsule* 1-celled, 2-valved.

SPEC. CHAR. *Leaves* ternate.

Syn.—Trifolium paludosum, *Ger. Em.* 1194. *f.*
Menyanthes palustre triphyllum, latifolium et augustifolium, *Raii. Syn.* 285.
Menyanthes, *n.* 633; *Hall. Hist. v.* 1. 280.
Menyanthes trifoliata, *Lin. Sp. Pl.* 208; *Willd. v.* 1. 811; *Fl. Brit.* 225; *Eng. Bot. v.* 7. *t.* 495; *Curt. Lond. fasc.* 4. *t.* 17; *Hook. Scot.* 71; *Fl. Dan. t.* 541; *Bull. Fr. t.* 131; *Bigelow Med. Bot. Amer. t.* 46; *Stokes, v.* 1. 298.

FOREIGN.—*Menianthe, ou treffle d'eau,* Fr.; *Trifolio fibrino,* It.; *Menyanthes de tres en rama,* Sp.; *Bitterklee,* Ger.

BUCK-BEAN, or Bog-bean, so termed from its leaves resembling those of the common garden-bean, is one of the most beautiful of our indigenous plants; "nor does it suffer," as Mr. Curtis justly observes, "when compared with the Kalmias, the Rhododendrons, and the Ericas of foreign climes, which are purchased at an extravagant price, and kept up with much pains and expense, while this delicate native, which might be procured without any expense, and cultivated without any trouble, blossoms unseen, and wastes its beauty in the desert air."

It is a native of many parts of Europe, growing abundantly in marshy meadows, and ponds, and sometimes even in ditches. The most spongy, boggy soils, which are inundated at certain seasons, and never wholly destitute of water, are the favourite stations of this plant. It often constitutes large beds, at the margins of ponds and brooks. We obtained it on the great bog on the western slope of Hampstead heath, where it grows in great plenty; but flowers very sparingly, about the end of June and beginning of July. It is common in many parts of North America, particularly in New England, and grows, according to Pursh, as far south as Virginia.

Professor Bigelow states, that the Buck-bean is one of those plants which are native in Europe, and North America, with so little difference of structure in the two continents, that their specific identity can hardly be doubted; and after examining specimens from both, he could perceive no definable difference, excepting in size. The English plant, however, flowers a month later than its American representative does in the neighbourhood of Boston.

Buck-bean has a long, creeping, jointed root, with perpendicular radicles, from which proceeds a smooth, erect, cylindrical stem, that is naked and destitute of leaves, and rises to the height of a foot. The leaves are bright green, obovate, wavy, with a thick midrib, smooth on both sides, ternate or growing by threes, like those of trefoil, (whence the names Marsh-trefoil, *trifolium* paludosum, *le Treffle d'eau*, and Menyanthes *trifoliata*,) at the extremity of a common foot-stalk, which issues immediately from the root, and is round, striated, forms a sheath at the bottom, and is shorter than the flowering stem. The flowers grow in a loose spike at the extremity of an erect, round, smooth stalk, longer than the leaves, which springs from within the sheath of a leaf. They are ten or twelve in number, each supported on its proper pedicel, and accompanied by small, ovate bracteas. The calyx is divided into five deep, slightly spreading segments: the corolla is funnel-shaped, divided beyond the middle into five deep, spreading or recurved, pointed segments, which are white tipped with rose-colour, smooth externally, and

clothed with dense, white, shaggy fibres on their upper side. The filaments are awl-shaped, bearing erect sagitate anthers of a reddish colour; germen conical; the stigma lobed or notched, with a slender style twice the length of the stamens. The capsule is ovate, succulent, 1-celled, which, when it has attained maturity, separates into two valves, inclosing several small roundish seeds of a brown or yellowish colour. Fig. (*a*) represents the flower expanded and somewhat magnified, to show the stamens, germen, and style.

Of the etymology of the *generic* name MENYANTHES, retained from the Greek and Latin botanists, we can give no really satisfactory account. Some render it moon-flower, a name which has reference to its presumed emmenagogne effects, in which case however it should have been written *Meneanthos*, as being compounded of μηνη the moon, and ανθος, a flower but such corruptions are not uncommon. Others deriving it from μενω, to remain, conceive the name to be expressive of the permanency of the flower; but this conjecture is even more fanciful than the former. The name Buck-bean, is either a corruption of Bog-bean, or, what is more probable, is derived from the French, *le Bouc*, a he-goat; the plant having formerly been distinguished by the appellation, *Phaseolus Hircinus*, that is, Goat's-bean.

QUALITIES AND CHEMICAL PROPERTIES.—The whole plant, and particularly the root, has an intensely bitter taste, which resides chiefly in an extractive matter, soluble in water and spirit. The root is, however, resinous, and impregnates alcohol more strongly than water; and may be precipitated from its tincture, in part, by the latter fluid. The bitter principle is not precipitated by infusions of galls, and is thought to be the same that abounds in gentian. According to the analysis of Fromsdorf, 100 parts of the fresh plant consists of 75 parts of water, and 25 of solid matter. The expressed juice on evaporation yields 0,75 of fecula and albumen, 0,25 of a green resin, with traces of malic acid, acetate of potash, a peculiar substance resembling animal matter, a very bitter azotic extract, and a brownish gum.

Medical Properties.—The root of this which given in small doses of about ten grains, imparts vigour to the stomach, and strengthens digestion. Its virtues were formerly properly estimated, and strange it is that so excellent and cheap a tonic should be so little employed. It gives out its bitterness to boiling water, and a tincture may be made from it quite equal in its effects to that of gentian. Large doses, either in substance or decoction, produce vomiting and purging, and frequently powerful diaphoresis; in which respect it resembles many other vegetable bitters. Formerly it was employed with benefit in intermittent, and remittent fevers. Boerhaave was relieved from gout by drinking the juice of the plant mixed with whey; while Alston, and others, assert that it has the power of keeping off the paroxysms of that painful complaint. Dr. Cullen speaks still higher of its virtues, for he had seen several instances of its good effects in some cutaneous diseases of the herpetic, or seemingly cancerous, kind, when taken by infusion, in the manner of tea. Others have commended it for rheumatism, dropsy, scurvy, and worms; and its reputation in the north of Europe, particularly in Germany, was at one time so high that it was consumed in large quantities, and deemed a sort of panacea. Its true character, however, is simply that of a powerful bitter tonic, like gentian, and centuary, to which, as Professor Bigelow observes, it is closely related in its botanical habit, as well as sensible properties. Linneus informs us in his Flora Lapponica, that in times of scarcity flocks will subsist upon this plant, notwithstanding its bitterness; and Dr. Tancred Robinson asserts, that sheep which have acquired a tabid condition are quickly recovered by feeding in the marshy meadows which abound with it. The Laplanders employ it as a substitute for hops; and they even introduce it in some instances into their bread, upon which Linneus bestows the epithet, "amarus et detestabilis." We conclude in the words of Bigelow when speaking of the American species: "we may regard this plant as one of the numerous bitters abounding in our country, which are fully equal in strength to imported articles of their class, and which may hereafter lessen our dependence on foreign drugs."



Chelidonium majus.

W. Clarke Del. Waddell fc.

LXXXVI

CHELIDONIUM MAJUS.

Common Celandine.

Class XIII. POLYANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. RHÆADEÆ, *Lin.* PAPAVERACEÆ, *Juss. De Cand.* &c. RHÆADINÆ PAPAVERACEÆ, *Burn.*

GEN. CHAR. *Calyx* of 2 leaves, caducous. *Petals* 4. *Pod* superior, 1-celled, of 2 valves. *Seeds* numerous, crested.

SPEC. CHAR. *Flowers* sertulate. *Leaves* pinnatifid, bluntly lobed and notched.

Syn.—Papaver corniculatum luteum, Chelidonia dictum, *Raii Syn.* 309. *β. Fl. Brit.* 563.
Chelidonium majus, folio magis dissecto, *Ger. Em.* 1069. *f.*
Chelidonium majus, foliis quernis, *Bauh. Pin.* 144; *Mill. Ic.* 61. *t.* 92. *f.* 2; *Fl. Dan. t.* 676.
Chelidonium, *n.* 1059. *Hall. Hist. v.* 2. 13.
Chelidonium umbelliferum, *Stokes Bot. Mat. Med. v.* 3. *p.* 180.
Chelidonium majus, *Lin. Sp. Pl.* 723; *Willd. v.* 2. 1141. *Fl. Br.* 563; *Eng. Bot. v.* 22. *t.* 1581; *Hook. Scot.* 167; *Woodv. Sup. t.* 263; *De Cand. Syst. v.* 2. 98; *Bull. Fr. t.* 61; *Fuchs. Hist.* 865. *f. Matth. Valgr. v.* 1. 576. *f.*; *Camer. Epit.* 402. *f.*
PROVINCIALLY.—*Greater Celandine; Swallow-wort; Tetter-wort.*

COMMON Celandine, or Greater Celandine, so named in contradistinction to Ranunculus *Ficaria*, Pilewort Crowfoot, which was called by the old botanists Lesser Celandine, is a perennial plant, growing wild in hedges and uncultivated grounds, especially on chalky soils, in Britain and other parts of Europe. It

delights in moist, shady situations, growing principally among rubbish, in the neighbourhood of villages, and flowering in May and June. We perceived it in the garden hedge at the Spaniards, on Hampstead heath, and also near Downshire Hill; as well as by the road side near Richmond, in Surrey, plentifully. It is one of those plants to which, on account of the very acrid and poisonous qualities of its juice, we have allotted a place in the present volume.

The Celandine rises from a spindle-shaped root, with a round, leafy, somewhat hairy, branched stem, swelled at the joints, to the height of two feet. The radical leaves are numerous, smooth, very deeply pinnatifid, or divided to the rib into two or three roundish and indented lobes, of which those of the extremities are the largest, of a bright green colour on the upper side, and glaucous or bluish-green underneath. The leaves arising from the stalks are of the same form, but of a paler colour, and placed alternately. The flowers, which are of a golden-yellow colour, are borne in small umbels on long, generally hairy footstalks, arising from the axillæ of the leaves. The calyx is inferior, consisting of two roundish-ovate, concave, acute, deciduous leaves. There are four roundish, spreading petals; the filaments are numerous, usually about thirty, shorter than the corolla, having oblong, compressed, obtuse, erect, 2-lobed anthers. The germen is superior, cylindrical, the length of the stamens, terminated by a small obtuse, heart-shaped, or cloven stigma, without a style. The seeds are numerous, ovate, smooth, with a crest along the upper edge, and contained in a linear, somewhat cylindrical pod, of one cell and two deciduous valves. They are disposed in two rows, on short stalks along a marginal receptacle, between the edges of the valves. Fig. (*a*) represents a petal; (*b*) a stamen with its anther; (*c*) the stigma at two different periods of its growth; (*d*) the pod and seeds.

A variety with very hairy stalks, and laciniated petals, has been supposed by M. De Candolle, and Lamarck to be a distinct species. It is mentioned by Clusius, Bauhine, and several other of the old botanists; it was found plentifully in the former part of the last century, among the ruins of the Duke of Leeds' seat at

Wimbledon; and, according to Lamarck, was cultivated in the royal garden at Paris, a little before the French revolution.

The generic appellation Chelidonium, from χελιδον, a *swallow*, is said to be expressive of a popular tradition among the ancients, that swallows made use of its juice to restore the sight of their young if blinded. A more probable notion, however, is, that it derives its name from the circumstance of its flowering about the time when these birds make their first appearance in spring.

Qualities. — Both varieties of Celandine agree in their medical qualities. The whole plant is very brittle, and exudes, when broken or wounded, an orange-coloured, fetid juice. Its taste is intensely bitter and acrid, occasioning a sense of burning in the mouth and fauces, similar to that produced by Cayenne pepper, which lasts for a considerable time. Both water, and rectified spirit extract nearly the whole of the active matter, which is most powerful in the root. The juice of the leaves is yellow, and gives a green tincture to rectified spirit; that of the root is of a deep saffron colour, and tinges the same menstruum of a brownish yellow. The pungency they possess is not of a volatile kind, for hardly any of it rises in distillation; yet it is lessened by drying the plant, or by inspissating with a gentle heat the spirituous or watery infusions. The parts of the plant employed in medicine, are the roots and leaves, particularly the former.

Poisonous Effects.—The juice of this species is a violent acrid poison, producing inflammation in the textures to which it is applied. A writer on poisons, in the Edinburgh Encyclopedia, says he has seen speedy death produced by it; and from the following experiments made by M. Orfila on dogs, it would appear that it proves fatal when introduced into the stomach, and applied to wounds.

1st. Three drachms of the watery extract of Celandine, were introduced into the stomach of a small, feeble dog, and the œsophagus was tied. At the end of six minutes the animal made violent efforts to vomit; four hours after, he was lying on the side; he made deep inspirations; sensibility and mobility

were diminished to such a degree, that the organs of hearing and vision were no longer capable of receiving impressions; he was not able to stand, and died a very short time after. The stomach contained a small quantity of a fluid excessively viscid, and of a brownish colour: the mucous membrane was of a bright red throughout its whole extent, and of a blackish red in its folds; the intestinal canal was not altered; the lungs were of a reddish colour, crepitating, and appeared not to be affected.

2nd. At three o'clock, an incision was made in the inside of the thigh of a small dog, and a drachm and a half of the watery extract of Celandine dissolved in a small quantity of water, was applied to the wound. At five, the animal experienced nothing remarkable. The next day, at nine in the morning, he was found dead. The digestive canal exhibited no sensible lesion; the wound was inflamed, and the lungs somewhat livid.

3rd. Four ounces of the juice of Celandine obtained from the leaves, were introduced into the stomach of a dog of middle size; the œsophagus was tied. The animal made efforts to vomit, moaned, and became insensible. He died ten hours after. The mucous membrane of the stomach was inflamed, and the lungs presented, here and there, livid patches, somewhat distended with blood.

From the preceding facts it results: 1st. that Celandine and its extract, produce serious symptoms, followed by death; 2dly. that their deleterious effects seem to depend on the local irritation they excite, as much as on their absorption and action on the nervous system; 3rd. that they appear to act on the lungs.

No remedy in the nature of an antidote has been proposed for this poison, beyond evacuation, diluents, and the usual antiphlogistic treatment.

Medical Properties and Uses.—Notwithstanding the extravagant eulogiums that have been bestowed upon this acrimonious plant by some of the modern, as well as ancient physicians, it is rarely administered internally. The virtues attributed to it are those of a stimulating aperient, diuretic, and sudorific. It was formerly regarded as a powerful deobstruent, and supposed to be particularly efficacious in the removal of obstructions

of the liver and other viscera, in promoting expectoration, in dropsies, and in the cure of intermittents, in herpetic eruptions, and even in pulmonary consumption. Tragus greatly extols its virtues in plague; boiled in vinegar, with the addition of *theriaca*, he affirms that it produced a profuse perspiration, and immediately removed the disease. It is said to have obtained a considerable reputation during the "sweating sickness" in this country, in which disease it was esteemed a specific. It must, however, be observed, that some writers have considered it a dangerous internal remedy, if too large a quantity be administered; it will consequently require great caution in its use, beginning with small doses, and increasing them gradually. Some authors recommend an infusion of it in wine, as the best preparation, which will take off a great deal of its acrimony. Geoffroy prescribes the following in cases of obstruction of the liver, and suppression of the menses. Take of leaves of Celandine a handful, cream of tartar a drachm. Macerate them in six ounces of whey; to the strained liquor add an ounce of syrup of succory, and make it into a draught to be taken on an empty stomach. For the above syrup may be substituted advantageously that of orange-peel; but it is very evident, in our opinion, that the dose is much too powerful. Ettmuller particularly recommends the external application of the bruised plant for those œdematous swellings of the feet, which succeed to violent fevers and other severe diseases, especially long-continued tertian, or quartan agues. The use of the orange-coloured juice in the jaundice, was probably suggested by the absurd Rosicrucian doctrine of signatures.

Joseph Miller, in his, "Botanicum Officinale, or Compendious Herbal," published in London, 1722, speaking of Celandine, says, "it is aperitive and cleansing, opening obstructions of the liver and spleen, and of great use in curing the jaundice and scurvy. Some reckon it cordial, and a good antidote against the plague. Some quantity of it is put into *aqua mirabilis*. Outwardly it is used for sore eyes, to dry up the rheum, and take away specks and films, as also against tetters and ring-worms, and scurfy breakings-out."

Externally, the juice has been long known as a popular remedy to destroy warts; and is said to be very efficacious in stimulating and healing old and indolent ulcers, speedily removing fungous flesh, and restoring a great degree of activity to the torpid and indolent granulations. For the removal of warts, the method of applying it is, simply to break the stalk, and to touch the part affected with the yellow juice that exudes. Fabricius Hildanus employed this juice successfully in opacities of the cornea; while Ettmuller, Geoffroy, and all the writers of that day, attest its efficacy when diluted with milk or some other bland fluid, in the removal of specks from that membrane. A cataplasm formed of the bruised leaves, and stalks, was formerly supposed to be an infallible remedy in herpes, and has been extolled for curing the itch.

Dose.—Of the dried root from ʒss to ʒj is a dose; of the fresh root infused in wine or in water the dose may be about ℥ss.



Helleborus Orientalis.

Waddell fcait.

HELLEBORUS ORIENTALIS.

Oriental, or True Officinal Hellebore.

GEN. CHAR. Vide XI.

SPEC. CHAR. *Leaves* pedate, hairy underneath. *Flower-stalks* radical, with many flowers. *Bracteas* deeply-lobed, serrated.

Syn.—Helleborus niger orientalis, amplissimo folio, caule prælto, flore purpurascente, *Tour. Cor.* 20; *Geoffr.* ii. 71. 76; *Bellon.* 196.
Helleborus officinalis, *Salsb. in Trans. Lin. Soc. v,* 8. *p.* 305.
Helleborus Orientalis, *Willd. Sp. Pl. v.* 3. 1337; *Lamarck Dict. v.* 3. 96; *De Cand. Syst. v.* 1. 317; *Sm. Prodr. Fl. Græc. v.* 1. *fas.* 6. *p.* 19.
Ellebore noir des Anciens, *Tourn. Voyage, tom.* ii. *Let.* xxi. *p.* 474.

WE have great pleasure in being able to present our readers with a correct figure of this rare plant, made from the most admirable drawing by Mr. Ferdinand Bauer for the Flora Græca, and published in vol. i. fasc. v. of that celebrated work. The plant, as we have already observed, was gathered on Mount Athos, Delphi, and Mount Olympus in Anatolia, on the hills, near Thessalonia, and abundantly near Constantinople, by Dr. Sibthorp, formerly Professor of Botany in the University of Oxford. It is unquestionably the true ελλεβορος μελας, of Dioscorides, and is named σκάρφη, by the modern Greeks, and by the Turks *Zopleme.* Tournefort justly supposes his Helleborus niger orientalis, amplissimo folio, caule prælto, flore purpurascente, to be the Hellebore of the ancients, as he found it in the island of Anticyra, famous for the production of this medicine.

The root is perennial, somewhat fleshy, black externally, and surrounded with many very long, dark-coloured, simple fibres.

The stem is very tall, round, smooth, leafy, and of a purplish colour. The radical leaves are stalked, very large, pedate, composed of about nine elliptic, oblong, serrate, pointed lobes, of a dark green colour on the upper surface, and paler, hairy, and veined underneath; those on the stem numerous, on roundish, smooth foot-stalks, channelled above, sheathing at the base, and slightly hairy below. The flower-stalks, which are axillary or terminal, and accompanied by numerous fringed, serrated, leafy bracteas, do not rise above the leaves, but are branched, bearing five or six drooping, concave flowers, of a greenish or whitish colour, turning purple as they fade. The petals are five, roundish, concave, and persistent; the nectaries are numerous, placed in a circle within the petals, deciduous, each of one leaf, tubular, compressed, with a reflected lip, and their base attenuated. The stamens are numerous, thread-like, with oblong anthers. The germens, which are five, of an oblong shape, terminated by the styles, become beaked pods, containing several seeds.—Fig. (*a*) represents a perfect flower, with the petals removed; (*b*) a single petal, to show three of the nectaries at its base; (*c*) the germens attached to the receptacle.

Medical Properties and Uses.—The roots of this species of Hellebore, formerly called *Melampodium* from their black colour, are acrid and violently cathartic. They have been supposed to be useful in maniacal cases, epilepsy, paralysis, hypochondriasis, dropsies, and a variety of other diseases; but as the genuine oriental plant may not be easily accessible to us, it is useful to know that the Helleborus *viridis* is the safest substitute for it, though less active; while the H. *fœtidus*, which has sometimes been used by fraud or mistake, is more violent and dangerous. We learn from Mr. Curtis, in his Flora Londinensis, that great quantities of the roots of H. *viridis* are annually sent up from the country, and used for the true black Hellebore. It has also been conjectured that their qualities are the same; for this species is more nearly allied to the ancient Greek plant than the Helleborus *fœtidus*. A full account of the Medical properties and uses of Hellebore has been already given, under Art. *Helleborus niger*, which, till lately, was supposed to be the drug used by the ancients.



Tamarindus indica.

TAMARINDUS INDICA.

The Tamarind Tree.

Class XVI. MONADELPHIA.—*Order* I. TRIANDRIA.

Nat. Ord. LOMENTACEÆ, *Lin.* LEGUMINOSÆ, *Juss.* CICERINÆ, CASSIACEÆ, CÆSALPINIDÆ, *Burn.*

SPEC. CHAR. *Calyx* in four deep segments. *Petals* three. *Barren filaments* six or seven. *Style* one. *Legume* pulpy within.

Syn.—Tamarindus, *Ger. Em.* 1607; *Park. Theatr.* 207; *Raii Hist.* 1748; *Rumph. Amb. v.* 2. 90. *t.* 23.
Tamarindus occidentalis, *Gærtn. Fruct. v.* 2. 310.
Siliqua Arabica, quæ Tamarindus, *Bauh. Pin.* 403.
Balam-pulli, *Rheed Maleb.* 1. 39. *t.* 23.
Tamarindus indica, *Lin. Sp. Pl.* 48; *Willd. v.* 3. 577; *Jacq. Amer.* 10. *t.* 10. 179. *f.* 98; *Woodv. v.* 3. *t.* 166.

FOREIGN.—*Le Tamarinier*; *Tamarin*, Fr.; *Tamarindo*, It. Sp.; *Tamarinho, Tamarinheiro, Tamarino*, Port.; *Der Tamarindenbaum*, Ger.; *Tamarindenboom*; *Tamaryn*, Dut.; *Tamarintræ*, Dan.; *Tamarintrad*, Swed.: *Tamer hendi*, Arab.; *Balam-pulli*; *Maderam-pulli*, Malab.; *Assam*, Java; *Cay me*, Cochin-ch.

THE Tamarind-tree, the *tetul* of Upper Hindustan, is likewise a native of Egypt and Arabia, as well as of the East Indies. In the West India islands, where it has become naturalized, it is cultivated for the sake both of its shade and its acid, cooling, highly grateful fruit; the pulp of which, mixed and boiled with sugar, forms an important article of commerce. It is very abundant in Jamaica, growing to a vast bulk, and thrives well in the Savannahs, but most luxuriantly in a deep rich brick mould. There is perhaps only one known species, the subject of the present article; but the West Indian Tamarind, believed to be only a variety of the East Indian one, differs so much in the form of its fruit, and the number of its weeds, that by some authors it is considered as specifically distinct.

The stem is lofty, and of considerable thickness, terminated by spreading branches, bearing tufts of alternate, abruptly-pinnate, smooth, bright green leaves, each composed of many pairs of elliptic-oblong, sessile, entire leaflets, about half an inch in length, and one sixth of an inch broad, rather glaucous beneath. It is observed, that these leaflets close at the approach of evening: or in cold moist weather, like those of the sensitive plant. The flowers are in simple clusters, terminating the short lateral branches: the calyx is inferior, of one leaf, divided into four deep, ovate, acute, deciduous, straw-coloured segments; the petals three, yellowish, beautifully variegated with red veins; ovate, acute, concave, wavy, reflexed, the length of the calyx, and inserted into the tube. The filaments are also three, awl-shaped, purplish, as long as the corolla, connected at the base, curved upwards, inserted into the mouth of the calyx, in the vacancy opposite to the uppermost petal, and bearing large, ovate, incumbent anthers. Besides these, there are six or seven rudiments of stamens, five or more of them setaceous threads, destitute of anthers. The germen is oblong, compressed, incurved, furnished with an awl-shaped style, rather longer than the stamens, and an obtuse stigma. The pods are oblong, compressed, with a joint, 1-celled, and of a dull brown colour when ripe. Those from the West Indies, from two to five inches long, with two, three, or four seeds; but those from the East Indies are almost twice as long, and contain eight or ten, and even twelve seeds. The seeds in both are roundish, somewhat angular, flattened, hard, polished, with a central circumscribed disc at each side, and lodged in a quantity of soft pulp. Fig. (*a*) represents the pod, and a single seed.

This tree, which is common in almost every part of Hindustan, as well as in the West Indies, grows most luxuriantly in all the eastern islands. The soil of Java is said to bring the fruit to very high perfection; but the Tamarinds from the depending island of Madura are reputed to be the best; they are of a dark colour, with a large proportion of pulp to the seeds. The natives of India consider it to be dangerous to sleep under the Tamarind-tree, especially during the night; "and grass," says

Dr. Ainslie, "or herbs of any kind, are seldom seen growing in such situations, and never with luxuriance;" which facts have been lately confirmed to us by a gentleman, who spent many years in India.

Long tells us in his valuable history of Jamaica, that "the fruit or pods are gathered in June, July, and August, according to their maturity. The pods must be fully ripe, which is known by their fragility, or easily breaking on a small pressure between the finger and thumb. The fruit taken out of the pod, and cleared from fragments of shells, is placed in casks, in layers, and the boiling syrup from the *tache* or first copper in the boiling house is poured in, just before it begins to granulate, till the cask is filled; the syrup pervades every part quite to the bottom, and when cool, the cask is headed for sale. The more elegant method is with sugar well clarified with eggs, till a clear transparent syrup is formed, which gives to the fruit a much pleasanter flavour." The East Indian tamarind differs from that of the West Indies, not only in the structure of the fruit, but in the relative sweetness; for the East Indian tamarinds are preserved without sugar, and exported to Europe in this form. Mr. Crawford says, that those exported from one part of the Archipelago to another, are merely dried in the sun, but those sent to Europe are cured with salt.

Qualities and Chemical Properties.—The pulp of the tamarind, which is inodorous, is brought to us chiefly from the West Indies, for medicinal purposes, mixed with the seeds, and small fibres, over which, as already stated, boiling syrup is poured. It possesses an agreeable, sweetish, acidulated taste, and is considered as no little luxury by persons in hot climates; and we are told that travellers passing through the deserts of Arabia generally take care to supply themselves with it at Cairo. By treating this pulp first with cold water, and afterwards with hot, Vauquelin separated the following substances:

Supertartate of potass	300
Gum	432
Sugar	1152

Jelly	576
Citric acid	864
Tartaric acid	144
Malic acid	40
Feculent matter	2880
Water	3364
	9752

Ann. de Chim. lxxiv. 303.

According to Ratier, a spurious article is frequently sold for the true tamarind.*

Medical Properties and Uses.—This fruit is cooling and laxative: but while it gratefully allays the thirst of ardent fever, it must be taken in large quantities to insure the latter effect, and is then apt to produce flatulence. It is generally added to cathartics that are given in infusion, with a view to promote their activity, or to cover their taste, and is a useful application to sore throats. The natives of India prepare a kind of sherbet from it; and the Vytians, like us, use it in their laxative electuaries. A decoction of the acid leaves of the tree they often employ externally, in cases requiring repellent fomentations, and in their collyria; and, internally, they are supposed by the Tamool doctors to be useful in jaundice. The stones of the tamarind, which to the taste are very astringent, are prescribed by the Vytians in dysenteric complaints, and for menorrhagia; and in times of scarcity, after being divested of the skin which covers them, by the processes of soaking and roasting, they are boiled, or fried, and resembling in taste a field-bean, are eaten by the poor of India. A decoction of the leaves is used in the West Indies to destroy worms in children.

Off. Prep.—Confectio sennæ. *Lond.*
Electuarium sennæ comp. *E.*
Infusum sennæ comp. *E.*
Inf. sennæ cum Tamarindis. *D.*

* Il est rare aujourd'hui de trouver dans le commerce du véritable tamarin; on le falsifie avec la pulpe de pruneaux et l'acide tartrique: cette fraude est très-difficile à reconnaître.—*Pharm. Française*, p. 138.

Pl. 89.



Cicuta virosa.

LXXXIX

CICUTA VIROSA.

Long-leaved Water Hemlock, or Cowbane.

Class V. PENTANDRIA.—*Order* II. DIGYNIA.

Nat. Ord. UMBELLIFERÆ, *Auctorum*, ANGELICINÆ, ANGELICACEÆ, *Burn.*

GEN. CHAR. *Calyx* with a 5-toothed slightly foliaceous margin. *Petals* ob-ovate, or slightly heart-shaped. Mericarps with 5 primary flattish equal ridges, and the vallecules with single vittæ that in the ripe fruit are more prominent than the ridges. The *seed* taper. The general *involucre* few leaved, or wanting, the partial many leaved. *Flowers* white.

SPEC. CHAR. *Leaves* twice ternate; *leaflets* linear-lanceolate, decurrent.

Syn.—Sium alterum olusatri facie, *Ger. Em.* 256. *f.*; *Raii Syn.* 212; *Lob. Ic.* 208. *f.*

Sium aquaticum, foliis multifidis longis serratis, *Moris, v.* 3. 283. *sect.* 9. *t.* 5. *f.* 4.

Sium erucæ folio, *Bauh. Pin.* 154; *Dalech. Hist.* 1094. *f.*

Cicuta aquatica Gesneri, *Bauh. Hist. v.* 3. *p.* 2. 175. *f.*

Coriandrum Cicuta, *Roth. Germ. v.* 1. 130. *v.* 2. *p.* 1. 347.

Sium, *n.* 781. *Hall. Hist. v.* 1. 346.

Cicuta virosa, *Lin. Sp. Pl.* 366; *Willd. v.* 1. 1445; *Fl. Brit.* 322; *Eng. Bot. v.* 7. *t.* 497; *Hook. Scot.* 92; *Woodv. Suppl. t.* 268; *Stokes, v.* 2. 117; *Fl. Dan. t.* 208.

PROVINCIALLY.—*Long-leaved Watercresses; Long-leaved Water Hemlock; Poisonous Cow-bane.*

FOREIGN.—*La cicutaire aquatique; La cigue aquatique*, Fr.; *Cicuta aquatica*, It.; *Cicuta acuatica*, Sp.; *Cegude aquatica*, Port.; *Der Wütherich, der giftige Wüterich: der Wasserschierling, Berstekraut*, Ger.; *Omeg, Omernik*, Russ.

THIS plant has often been confounded with the *Œnanthe* Phellandrium, in consequence of the same English name being applied to both. In Weller's work on poisonous vegetables, the old name of the latter plant is mentioned as a synonym of the Cicuta *virosa*, and as a natural consequence of confounding the two, the account of its properties, and effects, is made up from the history of both. By referring to figure 10, vol. i. of our work, and comparing the

two plants, together with the botanical descriptions of each, their specific differences will be readily distinguished, and the virtues of each accurately ascertained.

This plant, which is much more powerful in its effects than the Conium *maculatum*, is supposed by Haller and many others to have yielded the celebrated Athenian poison:* and as goats will not touch the common Hemlock, there is some reason to think that it is the species referred to by Lucretius:

> ——— Videre licet pinguescere sæpe cicuta
> Barbigeras pecudes, hominique est acre venenum.

The Cicuta *virosa* is by far the most active of the poisonous plants of Great Britain; fortunately, however, for us, it is somewhat scarce, or at least, very local in this country. It grows in several parts of England, in ditches, and by the sides of rivers and lakes, flowering in July and August. Professor Hooker, in his "*Flora Scotica*," enumerates the following as its principal stations in Scotland: the side of Loch-end, near Edinburgh; Pow Mill, Kinrosshire; in marshes near Forfar Loch; Otterton Loch, Fifeshire; about Mugdoch, Bardowie, and Douglaston Lochs; Loch near new Kilpatrick; and also near Glasgow, where it occurs in great abundance.

The root is perennial, tuberous, hollow, with many whorled fibres, and divided by transverse partitions into numerous cells. The stem, like the root, is very large, hollow, leafy, branched, furrowed, smooth, and rises to the height of three or four feet. The leaves are bi-ternate, of a bright green colour, and stand upon long foot-stalks; the radical ones pinnated; the leaflets deeply serrated, tapering at each end, from one to two inches long, and more or less decurrent. The flowers are produced in large, many-rayed umbels, partly terminal, and partly opposite to the leaves. The general bracteas are linear, seldom more than one or two, and frequently entirely wanting; the partial ones numerous, narrow, pointed, and unequal. The calyx consists of five ovate, acute, somewhat unequal, permanent leaves. The flowers are

* Cicutâ quoque venenum est, publica Atheniensium pœna invisa.
Pliny, 26. 13.

very small; the petals five, white, nearly heart-shaped, and incurved at the apex; the filaments are thread-shaped, spreading, about the length of the corolla, supporting roundish anthers: the germen hemispherical, ribbed; the styles two, filiform, at first short and erect, but subsequently elongated and spreading, with obtuse stigmas. The fruit is roundish, smooth, and divisible into two parts, having each one seed, convex, and marked with five flattish plane ribs, and on the other, with three prominent vittæ in the vallecules, which afford an excellent generic character. Fig. (*a*) represents the calyx; (*b*) the calyx with the germen and styles; (*c*) a perfect flower.

Poisonous effects and morbid appearances.—This violent poison produces the following symptoms:—Dazzling, obscurity of vision, vertigoes, cephalalgia, vacillating walk, agitation, anxiety of the precordia, cardialgia, dryness of throat, ardent thirst, eructations, vomiting of greenish matter, respiration frequent and interrupted, tetanic contraction of the jaws, lipothymia, sometimes followed by a state of lethargy, and coldness of the extremities; at other times a furious delirium, or attacks more or less approaching to epilepsy, especially in children, and young girls, which frequently terminate in death. In one or two cases, swelling of the face has been noticed, with starting of the eyes. The most serious derangement of the nervous system has always been observed; and has been more or less severe, in proportion to the quantity that may have been taken; unless a part of the poison have been quickly ejected from the stomach. Wepfer, who wrote a work entitled "Historia Cicutæ Aquaticæ," narrates many cases of its effects on different men and animals. The following account is gleaned from his admirable treatise, and subjoined to it is one of the cases, in his own words:

In the month of March, 1670, two boys and six girls found the roots of this plant in a meadow, and upon tasting them, perceiving that they were not unpleasant, all partook of them. The two boys, who ate a large quantity, were soon after seized with pains of the precordia, loss of speech, an abolition of all the senses, and terrible convulsions. The mouth was so closely shut, that it could not be opened by any means. Blood was forced from the ears, and the eyes were horribly distorted. Both the boys died in half an hour from the first accession of the symptoms. The six girls, who had taken a smaller quantity of the roots, were likewise seized with epileptic symptoms, but in the intervals of the paroxysms some

Venice treacle dissolved in vinegar, was given them; in consequence of which, they vomited and recovered: but one, the sister of the boys who died, after she had vomited, had a very narrow escape of her life; she lay nine hours with her hands and feet outstretched and cold. All this time she had a cadaverous countenance, and her respiration could scarcely be perceived. When she recovered, she complained a long time of pain in her stomach, and was unable to eat any food; her tongue being much wounded by her teeth, during the convulsive fits.

"Jacobus Mæder, puer sex annorum, capillis albis præditus, tener, vegetus tamen, domum rediit hilaris ac subridens, quasi re bene gestâ; paulo post conquerebatur de præcordiorum dolore, & vix verbum effatus, humi prostratus urinam magno impetu ad viri altitudinem eminxit; mox terribili aspectu, cum omnium sensuum abolitione convulsus fuit, os arctissime clausit, ut nullâ arte aperiri valuerit, dentibus stridebat, oculos mire distorquebat, sanguis ex auribus promanabat: circa præcordia tumidum quoddam corpus pugni virilis magnitudine Patri afflicti manum & miserandi pueri præcordia, maxime circa cartilaginem ensiformem, validissime feriebat: singultiebat crebro; Vomiturus quandoque videbatur, nihil tamen ore arctissime clauso ejicere valuit: artus mire jactabat & torquebat, sæpius caput retrorsum abripiebatur, totumque dorsum incurvabatur in arcum, ut puellus subtus per spatium inter dorsum & stratum inoffense repere potuisset. Cessantibus convulsionibus per momentum matris opem imploravit: mox pari ferociâ illis redeuntibus nullâ vellicatione, nullâ acclamatione, nullove alio ingenio excitari poterat, donec viribus deficientibus expalluit & manu pectori admota exspiravit. Durârunt hæc symptomata vix ultra horam dimidiam. Post obitum imprimis abdomen & facies intumuerunt absque livore, nisi pauco circa oculos conspicuo. Ex ore cadaveris usque ad horam sepulturæ spuma viridis largissime emanavit & quamvis sæpius à Patre mœstissimo detersa fuisset, mox tamen nova succedebat."

Schwencke, a German writer, also gives an account of four boys, who partook of this plant, three of whom died. The internal surface of the stomach was highly inflamed, and the brain gorged with blood. Boerhaave narrates some cases, where those who were vomited with the sulphate of zinc, recovered.

"Trois soldats allemands périrent en moins d'une demi-heure on trouva les membranes de l'estomac perforées chez l'un des trois, corrodées chez les deux autres L'estomac était rempli d'une écume blanchâtre. Les intestines, les poumons, et le cœur étaient flasques, et flétris, les vaisseaux veineux pleins d'un sang très-fluide."—*L'Histoire de l'Académie des Sciences de Paris, année* 1715.

Linnæus, in his Flora Lapponica, gives a long account of a fatality which befel the cattle, and which he was enabled to arrest, by ascertaining the important fact, that it was entirely owing to their eating the Cicuta *virosa*.

Treatment.—See Art. No. I. Vol. i.

P. 20.



Guaiacum officinale

GUAIACUM OFFICINALE.

Officinal Guaiacum, or Lignum Vitæ.

Class X. Decandria.—*Order* I. Monogynia.

Nat. Ord. Gruinales, *Lin.* Rutaceæ, *Juss.*

Rutaceæ, Zygophyllidæ, *Burn.*

Gen. Char. *Calyx* 5-cleft, unequal. *Petals* 5, equal, filaments naked. *Capsule* angular, 2 to 5-celled.

Spec. Char. *Leaves* of two pair of elliptical obtuse leaflets, peduncles geminate, fruit 2-celled.

Syn.—Arbor ligni sancti, vel guaiacum, *Seb. Thes.* 1. *p.* 86. *t.* 53. *f.* 2.
Guaiacum Jamaicense, *Pluk. Phyt. t.* 53. *f.* 3, 4.
Lignum Vitæ, *Sloane, Jam. v.* 2. 134. *t.* 222. *f.*
Guaiacum officinale, *Lin. Sp. Pl.* 546; *Willd.* 2. *p.* 538; *Ait. Hort. Kew. v.* 3. ed. 2. *p.* 83; *Woodv. v.* 1. 43. *t.* 16; *Stokes Bot. Mat. Med. v.* 2. 486.

Foreign.—*Le gayac officinal*, Fr.; *Guaiaco*, It.; *Guayacan, guayaco*, Sp.; *Guyaiaco*, Port.; *Das Franzosenholz; Pockenholz; Pokhout Franzostræe*, Dan.; *Fransosenholts*, Swed.; *Bakaut*, Rus.

This tree, the wood of which is well known in England under the name of Brazil wood, or *Lignum vitæ*, is a native of Jamaica, Hispaniola, and the warmer parts of America. It has been long in use, and appears from the MSS. of Sir Hans Sloane, in the British Museum, to have been first cultivated in this country by the Duchess of Beaufort in 1699. It is said to flower from July to September.

The tree rises to the height of thirty or forty feet, and is near a foot in the diameter of its trunk, with numerous divaricated knotty branches, leafy at the ends. The bark is very smooth, variegated with green and white; that of the branches being uniformly ash-coloured, striated, and marked with fissures. The wood is hard and ponderous, dark, olive-brown within, whitish

towards the bark, and has a peculiar acid aromatic scent. The leaves are opposite, abruptly pinnate, consisting of two or three pairs of ob-ovate or roundish, obtuse, entire, smooth, dark-green, rigid, leaflets, various in size, with several radiating veins, and nearly sessile. The flowers are pale blue, on simple, axillary, clustered stalks, shorter than the leaves. The calyx consists of five ovate-oblong, obtuse, concave, spreading deciduous leaves; the two outer ones rather the smallest. The petals are five, roundish, ob-ovate, concave, spreading, with short linear claws, inserted into the receptacle. The stamens are ten, awl-shaped, erect and villous, with oblong incumbent, cloven anthers, the germen is obcordate, with a short awl-shaped style. The capsule is somewhat turbinate, on a short stalk, smooth, succulent, pale, ferruginous or yellow, with from two to five rounded, slightly bordered angles, and as many cells bursting at the angles, but two or three of the cells are frequently abortive. The seeds are solitary, pendulous, ovate, convex on one side, angular at the other, the albumen cartilaginous and chinky, the embryo nearly straight with thickish cotyledons.—Fig. (*a*) represents a flower somewhat magnified; (*b*) the calyx: (*c*) a stamen, with its anther; (*d*) the germen; (*e*) the capsule; (*f*) a vertical section of the same; (*g*) a transverse section.

Guaiacum is a barbarous name, derived from the Spanish one *Guaiac* or *Guayacau*, which itself originated from *Hoaxacan*, the Mexican appellation of the plant.

Qualities and Chemical Properties.—The wood of this tree, and the peculiar matter which it yields, are the parts medicinally employed. The wood is hard and heavy, and is much used for ship-blocks and for toys. It is nearly inodorous, but has a warm, somewhat bitter taste; and its virtues depend upon the resin-like substance which it contains. It is rasped for medical use, but we are inclined to think that it yields little of its powers to decoction.

The Guaiacine exudes spontaneously from the trunk and branches of the tree; and concreting, forms tears of a semi-pellucid and pure nature. By making incisions in the month of May, greater quantities flow, and after becoming hard, by exposure to the sun and air, it is collected and packed in casks for exportation. Ano-

ther method for obtaining it, is by sawing the trunk and large limbs into billets, about three feet long: an auger hole is then bored lengthways in each, and the other end of the billet being put in a fire, the melted matter flows into calabashes, placed purposely to receive it. By boiling chips, or raspings of the wood in water, with common salt, the Guaiac swims at the top, and may be skimmed off. Sometimes it is adulterated with common resin and the Machineel gum. The former is detected by its smell, if heat be applied, and the latter "by adding to the alcoholic solution a few drops of sweet spirits of nitre, and diluting with water; the guaiac is precipitated, but the adulteration floats in white striæ."

Guaiacum was considered by chemists as a resin, till Mr. Hatchett observed, that when treated with nitric acid it yielded products very different from those of resinous bodies. This induced Brande to examine its chemical properties in detail. To his valuable paper we are indebted for almost all the accurate information which we possess respecting its chemical nature.

"*Guaiacum* is a solid substance, resembling a resin in appearance. Its colour differs considerably, being partly brownish, partly reddish, and partly greenish; and it always becomes green when left exposed to the light in the open air. It has a certain degree of transparency, and breaks with a vitreous fracture. When pounded it emits a pleasant balsamic smell; but has scarcely any taste, although when swallowed it excites a burning sensation in the throat. When heated it melts, and diffuses at the same time a pretty strong fragrant odour. Its specific gravity is 1·2289.

"When *guaiacum* is digested in *water* a portion of it is dissolved, the water acquiring a greenish-brown colour and a sweetish taste. The liquid, when evaporated, leaves a brown substance, which possesses the properties of *extractive;* being soluble in hot water and alcohol, but scarcely in sulphuric ether, and forming precipitates with muriates of alumina, tin, and silver. This extractive amounts to about nine parts in the hundred of guaiacum.

"*Alcohol* dissolves guaiacum with facility, and forms a deep brown-coloured solution. Water renders this solution milky by separating the resin. Muriatic acid throws down the guaiacum of an ash-grey, and sulphuric acid of a pale-green colour. Acetic acid, and the alkalies occasion no precipitate. Liquid chlorine throws it down of a fine pale-blue, which does not change when dried. Diluted nitric acid occasions no change at first; but after some hours the liquid becomes green, then blue, and at last brown, and at that period a brown coloured precipitate falls down. If water be mixed with the liquid when it has assumed a green or a blue-colour, green and blue precipitates may be respectively obtained.

" *Sulphuric ether* does not act so powerfully on guaiacum as alcohol. The solution obtained by means of it, exhibits the same properties when treated with re-agents as that in alcohol.

" The *alkaline solutions*, both pure and in the state of carbonates, dissolve guaiacum with facility. Two ounces of a saturated solution of potash dissolved about 65 grains of guaiacum; the same quantity of ammonia only 25 grains; or guaiacum dissolves in about 15 parts of potash, and 68 parts of ammonia. Nitric acid threw down from these solutions a brown precipitate, similar to what is obtained when the alcoholic solution is mixed with the same acid. Muriatic acid, and diluted sulphuric acid, throw down a flesh-coloured curdy precipitate, which in its properties approaches the nature of extractive.

" Most of the *acids* act upon guaiacum with considerable energy. *Sulphuric acid* dissolves it, and forms a deep-red liquid, which deposits while fresh a lilac-coloured precipitate when mixed with water. When heat is applied the guaiacum is charred.

" *Nitric acid* dissolves guaiacum completely without the assistance of heat, and with a strong effervescence. When the solution is evaporated, it yields a very large quantity of oxalic acid. No artificial tannin appears to be formed, but rather a substance possessing the properties of extractive.

" *Diluted nitric acid* converts guaiacum into a brown substance, similar to the precipitate obtained by nitric acid from the alcoholic solution of guaiacum. This brown matter possesses the properties of a resin.

" *Muriatic acid* acts but slightly, as the guaiacum soon melts into a blackish mass, which is not acted upon.

" When guaiacum is distilled, 100 parts of it yielded to Mr. Brande the following products:

Acidulous water	5·5
Thick brown oil	24·5
Thin empyreumatic oil	30·0
Charcoal	30·5
Gases, consisting of carbonic acid, and carburetted hydrogen	9·0
Loss	0·5
	100·0

The coal, when incinerated, left three grains of lime, but no alkaline substance.

Such are the properties of guaiacum, as far as they have been hitherto ascertained. From the preceding detail, it is obvious that guaiacum in many respects coincides with the resins: but it differs from them in three particulars so remarkable, that we cannot avoid considering it as a distinct substance. The *first* of these is the great quantity of charcoal which it leaves when distilled in close vessels. This Mr. Brande found to amount to above 30 per cent.; while the re-

sins, in like circumstances, hardly ever leave more than 15 per cent. of charcoal, and often not nearly so much. It is possible, however, and indeed not improbable, that this difference is to be ascribed to the different degrees of heat employed. The *second* peculiarity is the action of nitric acid on guaiacum. This acid does not dissolve the resins without the assistance of heat, but converts them into a brown brittle mass; whereas it dissolves guaiacum completely. The action of this acid on the resins terminates in the formation of artificial tannin, whereas its action on guaiacum terminates in the formation of oxalic acid. This striking difference is alone sufficient to warrant a separation of guaiacum from the resins. The *third* peculiarity is the remarkable suite of changes of colour which guaiacum undergoes when its solutions are treated with nitric acid, and chlorine. Dr. Wollaston first observed that guaiacum becomes green when exposed to light, provided air have access to it; and that the colour is again removed by the application of heat. Hence it is probable that oxygen occasions the change. This opinion is much strengthened by the experiments of Mr. Brande. When guaiacum was put in contact with oxygen gas, it became green sooner than in the open air. When put into chlorine gas it became first green, then blue, and lastly brown; and ammonia, when left in contact with it, restored again its green colour. In like manner, by treating the alcoholic solution of guaiacum with nitric acid, green, blue, and brown precipitates are obtained, according to the length of time that the acid is allowed to act upon it. These facts give considerable plausibility to the opinion of Mr. Brande, that the changes of colour are owing to the combinations of oxygen with the guaiacum; that the green contains the least, and the brown the most oxygen, while the blue is intermediate. Thus guaiacum in its changes of colour, bears some resemblance to indigo. Mr. Brande has remarked a coincidence also between guaiacum and the green resin of the leaves of plants.

Medical Properties and Uses.—The Guaiacum wood was first employed by the natives of St. Domingo as an antidote against lues venerea. The Spaniards soon acquired a knowledge of its virtues, and introduced it into Spain as early as the year 1501. The fame of this new remedy was diffused with such celerity through the other parts of Europe, that according to the testimony of Nicholas Poll, more than three thousand diseased persons had derived permanent benefit from the use of it, before the year 1517.*

A decoction of this wood, made with water, and sometimes with wine,† was administered under every form, and during

* Aphrodisaicus Aloys. Luisini. Ed. Lugd. 1738.
† Lud. Septalii. Animad. Lib. vii.

every period of the disease; the physicians directing at the same time purgative medicines, at proper intervals; confinement to the house; vapour baths; and an appropriate course of diet, which was commonly dictated with a tedious exactness, bearing the signature of superstition rather than of medical science. This process continued during six weeks, and often for a longer time, with such occasional variations as new circumstances might suggest, was long regarded as the most safe and efficacious mode of treating patients afflicted with syphilis.

The advantages which were connected with this method of cure, were so commonly believed and acknowledged, that during a considerable period of time, the exhibition of mercury was not only discontinued, but the practice was publicly censured, as inefficacious and prejudicial. Many of the most eminent writers of the sixteenth century contended that Guaiac was a true specific, having the power of correcting the qualities of the venereal poison, and of expelling it out of the system; and this opinion was revived, and ably supported in the eighteenth century, by a man whose capacity, learning, and medical science, added lustre to the country and period in which he flourished.*

Those favourable reports of the virtues of Guaiacum, which maintained their credit through more than two centuries, were not founded merely on the frail basis of partiality, or prepossession; they were supported by well-attested narratives of its good effects in great numbers of instances, where no mercury had been employed, or when that medicine had done no permanent good; or when the patients had suffered from it, instead of finding advantage. Yet, notwithstanding the numerous and respectable testimonies which were adduced in proof of the efficacy of this vegetable, its most strenuous advocates were obliged to confess, that Guaiacum was frequently administered in vain. The disappointments which medical practitioners often experienced when they had relied on Guaiacum alone, as a specific remedy, introduced again the more frequent use of mercury; and, as this active medium was soon employed with more caution and judgment than formerly, a very important change in the mode of

* Boerhaave, Prefat. ad Aphrodisiac.

treating lues venerea was established. Nevertheless, so firmly were the generality of physicians persuaded of the anti-venereal virtues of Guaiacum, that the same men who contended for the necessity of a nominal salivation, maintained that this vegetable was not a less real, though not quite so potent an antidote.* "When I was intrusted with the care and management of the Lock Hospital in 1781," says Mr. Pearson, "I observed, that Mr. Bromfield and Mr. Williams had been long accustomed to repose great confidence in the medicinal powers of a decoction of the Guaiacum wood; and that a method somewhat similar to that proposed by Ulric Hulten,† and strongly recommended by Boerhaave, had been adopted in the hospital during many years. The patients for whom it was directed, were those who had previously used the ordinary quantity of mercury, but who complained of nocturnal pains; who had nodes, ozæna, and such other effects of the venereal virus, connected with secondary symptoms, as did not yield to a course of mercurial frictions. The diet of these patients consisted of raisins, and hard biscuit; they drank from two to four pints of the decoction of Guaiacum every day; they were ordered to use the hot bath twice in the week; and they commonly took a dose of antimonial wine, and laudanum, or of Dover's powder, every evening.

"It was not thought necessary, however, to confine such patients to their beds; and they were seldom exposed to the vapour of burning spirit to excite perspiration; for it was deemed sufficient to produce and support a moist state of the skin, without urging the process so far as to occasion profuse sweating. This plan of treatment was sometimes of singular advantage to those whose health had sustained injury from the complicated operation of the disease, combined with confinement, and a long course of mercury. The breaches made in the constitution were repaired; the strength recruited; untractable ulcers were frequently healed; carious bones exfoliated; and those anomalous symptoms which would have been exasperated by mercury, yielded readily to the decoction of Guaiacum. In tracing carefully the history of this

* Brassavolus, Fallopius, &c.
† De Morbi Gallici curatione per administrationem Ligni Guaiaci.

once celebrated remedy, nothing can be more evident than this, that it was administered to persons afflicted with very different forms of disease. One numerous class of patients consisted of those, who having used mercury according to the severe, and often injudicious mode which was practised two centuries ago, found themselves harassed with pains, nodes, ulcers, and several other symptoms, from which they were finally relieved by a course of Guaiacum. Hence it was concluded that this medicine was superior, as an antidote to mercury. Another class adopted the Guaiacum course from the first attack of their disease, and deriving sensible benefit, hastily presumed that a cure was accomplished; but, although their frequent relapses might have shaken their confidence, yet, as the renewal of their Guaiacum course mitigated the violence of their symptoms, and often produced considerable appearances of amendment, they preferred this palliative method of proceeding, to the more distressing concomitants of a course of mercury.

"In addition to these observations, it may be further suggested, without any violation of candour, or of respect to our predecessors, that at a time when the natural history of Lues Venerea was so imperfectly understood, many morbid appearances totally unconnected with that poison, were nevertheless referred to it; and that the cure of such mistaken symptoms would contribute greatly to augment the fame of the remedy. When it is therefore considered, that the good effects of Guaiacum are not absolutely confined to those cases, where a quantity of mercury, sufficient to destroy the syphilitic virus has been introduced into the system; but, that it may operate like a true antidote, suspending for a time the progress of certain venereal symptoms, and removing other appearances altogether; when subsequent experience nevertheless evinces, that the subdued virus yet remains active in the constitution; we shall be competent to the explanation of many of those contradictory assertions which abound in writers upon this subject.

"This decoction, (continues Mr. Pearson,) excites a grateful sensation of warmth in the stomach; it gives a sense of dryness to the mouth, and creates a thirst; it also increases the natural

temperature of the skin, and renders the pulse more frequent. If the patient drink the decoction warm, and lie in bed, it generally proves moderately sudorific; and this effect may be heightened as much as we please, by employing the hot bath, the vapour bath, antimonials combined with opium, or Dover's powder. When the decoction has been continued during ten or twelve days, in the quantity of four pints each day, the patient often complains of heart-burn, accompanied with flatulence; and he is usually costive during the whole course. If the person expose himself freely to the air while he is taking this medicine, the secretion of urine will be augmented; but no sensible alteration will take place in the state of the skin. When I have exhibited the decoction in pains of the bones, confining the patient to bed, and enjoining a diet consisting of fluids only, I have rarely seen any beneficial consequences result from the use of it, excepting when it acted as a sudorific: and, in this respect, I think its qualities manifestly inferior to antimony or volatile alkali. In several instances, after persisting in a course of it during four or five weeks, I have not gained any material advantage, and I have remarked, that when the *dolores ostocopi* were not connected with some morbid alteration of the structure of a part, this medicine was of little avail. When the strength and vigour have been reduced by a successful mercurial course, with confinement to the house, and when a thickened state of the ligaments, or of the periosteum, remains, or where there are foul, indolent ulcers, these sores will often heal, and the enlarged membranes will subside, during the administration of this decoction. It will often suspend the progress of certain secondary symptoms of Lues Venerea for a short time; such as, ulcers of the tonsils, venereal eruptions, and even nodes: but, I never saw one single instance in which the powers of this medicine eradicated the disease. I have been recommended by many people to combine Guaiacum with mercury, with the intention of improving the specific power, and of counteracting the injurious effects of that mineral. The advantages to be derived from this compound mode of treatment are by no means well established: for Guaiacum is certainly no antidote against syphilis; nor have any proofs been given to the public of its ameliorating the action of mercury. When the de-

coction is given during the mercurial course, it sometimes seems to improve the health; but, as it is very liable to produce complaints in the stomach and bowels, the palpable inconveniences commonly surpass the uncertain disadvantages connected with it; and as no previous course of the decoction renders the disease milder, nor authorises us to rest satisfied with a smaller quantity of mercury than usual, it will seldom happen that a satisfactory reason can be assigned, for giving the two medicines at the same time.

"In concluding, I would remark, that I have given the decoction of Guaiacum with the best effects to a great number of patients in cutaneous diseases, in ozæna, and in scrofulous affections of the membranes and ligaments, and it appears to me, that it is equally efficacious in such morbid alterations, which are not at all connected with Lues Venerea, nor with the mode of treating it, as in those cases for which it has been most highly celebrated." To sum up the virtues of Guaiac, it may be said that it is a stimulating medicine; proving diaphoretic in a dose of a scruple, or half a drachm; purgative, in large doses; and when it fails to act on the skin, it increases the secretion of urine. It is frequently employed in chronic rheumatism, to excite perspiration; or in smaller doses still, to keep up a gentle determination to the skin. Combined with opium, its sudorific effects are increased; and the decoction of the wood is said to increase the power of senna, and to prevent its griping. It is either given in substance in the form of a bolus, or diffused in water by the medium of mucilage. The volatile tincture is more highly stimulating than the simple, and is more generally employed. In full doses, it is said to prevent the formation of that membranous substance which is thrown off by the uterus, and which is often found to accompany the *Paramenia difficilis* of Dr. M. Good.

Off. Prep. Decoctum Sarsaparillæ comp. *L. D.*
Decoctum Guaiaci comp. *E.*
Mistura Guaiaci. *L.*
Tinctura Guaiaci. *L. E. D.*
Tinctura Guaiaci Ammoniata. *L. E. D.*
Pulvis Aloes comp. *L. D.*
Pilulæ Hydrargyri Sub-muriatis comp. *L. E.*

Pl 91.



Arbutus Uva Ursi?

Weddell Fecit

ARBUTUS [ARCTOSTAPHYLOS] UVA URSI.

Trailing Arbutus, or Red Bear-berry.

Class X. DECANDRIA.—*Order* I. MONOGYNIA.
Nat. Ord. BICORNES, *Lin.* ERICÆ, *Juss.*
ERICEÆ, *De Cand.* ERICACEÆ, *Burn.*

GEN. CHAR. *Calyx* 5-parted. *Corolla* ovate, pellucid at the base. *Berry* superior, 5-celled.

SPEC. CHAR. *Stems* procumbent. *Leaves* entire, evergreen.

Syn.—Vaccinia ursi, sive Uva ursi apud Clusium, *Ger. Em.* 1416.
Vaccinia rubra, foliis myrtinis crispis, *Raii Syn.* 457; *Merr. Pin.* 123.
Vitis Idæa, foliis carnosis et veluti punctatis, *Bauh. Pin.* 470.
Uva Ursi, *Clus. Hist. v.* 1. 63. *f.*; *Lob. Obs.* 547; *f.*; *Ic.* 366. *f.*
Arbutus, *n.* 1018; *Hall. Hist. v.* 1. 434.
Arbutus Uva ursi, *Sp. Pl. Willd. v.* 2. 618; *Fl. Brit.* 443; *Eng. Bot. v.* 10. *t.* 714; *Hook. Scot.* 126; *Woodv. v.* 1. *t.* 70; *Fl. Dan. t.* 33.

PROVINCIALLY.—*Bear-berries; Bear Whortle-berries. Braoileagna-na-con*, of the Scottish Highlanders.

FOREIGN.—*La bouserolle ou l'arbousier trainant, vulg. le Raisin d'ours*, Fr.; *Corbezzolo uva d'orzo*, It.; *Uba d'oso; ubaduz, gayuba, gayubera, ayauja, avujes*, Sp.; *Uva de orso*, Port.; *Die Bärentraube, die Bärenbeere, die Mehlbeere*, Ger.; *Meelbær-Rüs*, Dan.; *Mjölon*, Swed.; *Beerendruif*, Dut.; *Tolokn-janka*, Russ.

THIS pretty evergreen shrub is met with both in the old and new continents; for, in the northern parts of Europe, it abounds in Sweden, Lapland, and Iceland; it is extensively diffused over Scotland and the north of England, and extends southerly to the shores of the Mediterranean. It is also found in Siberia, and is represented as abundant on the banks of the Wolga; while in North America it grows from Hudson's Bay, as far south as the central parts of the United States.

With us, it occurs only in dry, stony, subalpine moors, covering the ground with beds of considerable extent, at the height of 1,500 feet and upwards above the level of the sea. It is common throughout the Highlands, and Western Islands of Scotland, and

abounds at Dunkeld and Blair, the seats of the Duke of Athol, in Perthshire. It is the plant mentioned in Ray's Synopsis, p. 458, as found by Mr. Lhwyd, growing plentifully in the isle of Mull, at the end next Y-Columb-kill, for the space of several miles. It was perceived many years ago by Lightfoot, at the top of East common wood, about a mile from Hexham, in Northumberland; and is said by Mr. Winch to flourish on Cronkley Fell, and Blanchland in the same county, at an elevation of 200 to 2,000 feet.*

The root is perennial, long, and fibrous; sending off several round, woody, branched, spreading, procumbent stems, covered with a smooth deciduous bark. The leaves are not unlike those of the Box, alternate, evergreen, obtuse, ob-ovate, entire, attached by short stalks, coriaceous, smooth, convex, dark green, and wrinkled above; concave, finely reticulated and paler beneath, with the margin rounded, and in the young ones pubescent. The flowers which are produced in June, grow in small clusters at the extremities of the branches, each supported on a short red footstalk, and furnished with many acute coloured bracteas. They are usually five or six on each branch, drooping, and of a pale rose-red colour. The calyx is small, obtusely 5-toothed, and persistent. The corolla is ovate, smooth, transparent at the base, contracted at the mouth, with five short reflexed segments. The filaments are awl-shaped, downy, inserted at the base of the corolla, and crowned with reddish incumbent anthers, of two oval cells, opening by two terminal pores, and bearing a pair of short horns or spurs. The germen is roundish, bearing a cylindrical erect style, the length of the corolla; with a simple stigma. The fruit is a small, globular, smooth, depressed scarlet berry, containing a mealy pulp of an austere taste, and four or five angular seeds. Fig. (*a*) represents the calyx; (*b*) a flower cut open to show the stamens; (*c*) a stamen, with its anther; (*d*) the berries; (*e*) a berry divided transversely, to show the seeds.

The plants of this genus are very nearly allied to those of the

* See a paper on the Geography of Plants in the *Annals of Philosophy*, May 1818.

Vaccinium, or Whortle-berry, from which they differ principally in the situation of the berry, which in the Arbutus grows above the calyx; and in the Vaccinium below it. The present species may be distinguished from the Arbutus *alpina*, or Black Bearberry, by the figure of the leaves, which in the former are smooth, and entire, while in the latter they are rugged, and serrated.

Qualities and Chemical Properties.—The leaves of this plant, which are the parts used in medicine, are slightly bitter, and astringent to the taste. The result of Dr. Bigelow's chemical trials with them, shows that they abound in tannin. A solution of jelly occasioning a copious precipitate; sulphate of iron an equally copious one of a black colour. Nitrate of mercury gives a precipitate of a light green colour: lime-water, of a brownish colour. The existence of gallic acid is somewhat problematical; and the quantity of resin, mucous matter, and extractive, provided they reside in the plant, must be minute; since the decoction is not rendered turbid by the addition of alcohol, or ether, nor the tincture by the addition of water. Muriate of tin produced no precipitation from the decoction, though it did from the tincture. Acetate of lead, and nitrate of silver, gave large precipitates. Water takes up a larger portion of soluble matter than alcohol, and may therefore be considered the best menstruum. Professor Murray, of Gottingen, prefers the decoction to the infusion for medical purposes.

Medical Properties and Uses.—The Arbutus *Uva-ursi* is supposed by Clusius to be the αρκτον σταφυλη of Galen, celebrated by him as a remedy in hæmoptysis, and described as follows: "Uva-ursi in Ponto nascitur, planta humilis et fruticosa, folio Memæcyli, fructum ferens rubrum, rotundum, gustu austerum." But this description is too imperfect to satisfy us as to the identity of the plant.

As a diuretic, uva-ursi has been much employed for calculous affections, especially when attended by purulent discharges. De Haen speaks very favourably of it in such cases; and as it has a tendency rather to decrease arterial action, than to augment it, it may be exhibited in almost every state of the system, and in

nearly every variety of the diseases of the urinary organs. To its great efficacy in some of these affections, Ferrier gives his decided testimony. "I have," says he, "given this medicine in a considerable number of nephritic affections in very moderate doses, and always with manifest advantage. When the pain is very acute, and the pulse quick, I begin the cure with bleeding, and a gentle purgative composed of manna, and neutral salts. This purgative I repeat twice a week, and on the intermediate days direct the patient to take five grains of the uva-ursi, and half a grain of opium, three or four times a day, according to the urgency of the symptoms. This method always relieves, and generally effects a cure. Of sixteen patients treated in this manner, I have discharged twelve cured. On reckoning the cures, I do not rest on the cessation of a single fit, but require a permanent relief from pain. Many of my patients have used this remedy for several months together, before this end was attained. The fits became slighter, and at length ceased."

Conjoined with soda it is an admirable remedy for catarrhus vesicæ and for strangury, arising from blisters. It is frequently resorted to for diabetes, and after the febrile symptoms which usually attend that disease, have been reduced by copious bleeding, purging, and other preliminary measures, the uva-ursi imparts tone to the stomach, and frequently mitigates this particular affection of the kidneys. It was at one time supposed to be useful in calculous cases, and experiments were instituted to ascertain whether it were not capable of dissolving stone in the bladder. The results most in favour of its solvent power, were those of Girardi, who diminished the weight and consistency of urinary calculi, by digesting them in a preparation of this plant. It appears, however, that the preparation which he employed was an acid liquor, obtained by a destructive distillation of the leaves, and probably not superior to other weak acids in its solvent powers. On the other hand, Professor Murray found, what might reasonably be expected, that these calculi were not materially affected by long digestion in a decoction of this plant, at various temperatures. Professor Barton found the plant of great

service in his own case of nephritic paroxysms, alternating with gout in the feet: and in those which were brought on by gravelly concretions, the uva-ursi appeared to Professor Bigelow to allay irritability, and to hasten the relief of the symptoms.

It was in consequence of its apparent virtue in counteracting a protracted disease of the urinary passages, attended with emaciation, and all the characteristics of hectic fever, that Dr. Bourne, of Oxford, was induced to make trial of its efficacy in phthisis pulmonalis, and other affections rendered in some measure analogous to genuine pulmonary consumption, by the decided existence of hectic irritation. After a recital of the case above alluded to, Dr. Bourne, in his work, minutely details the symptoms, and method of treatment in sixteen separate cases, which are arranged under four general heads. The first eight are supposed to be instances of "true pulmonary consumption in its first stage;" the ninth, tenth, and eleventh of this disorder in a confirmed state, attended with purulent expectoration; the two succeeding, some affections of the lungs attended with expectoration of pus, but which, nevertheless, were not genuine phthisis; and the three last were cases of hectic, in which the lungs appeared not to be primarily affected, or not at all. In the majority, however, of the above cases, the uva-ursi was not had recourse to without auxiliary combinations, and in some instances its employment was for a time entirely suspended. In the cases which are recited in the Appendix, the medicine appears to have received a fairer trial, and to have been attended with more decided effects. Extreme candour and moderation pervade the pages of Dr. Bourne's work; and although our own experience of uva-ursi in pulmonary affections does not authorize an opinion independently of that formed by a perusal of this book, Mr. Davie, of Framlingham, Suffolk, has given cases of its decidedly curative powers; and there can be little doubt of its being capable of allaying irritability of system; for, according to experiments instituted on the pulse by Dr. Mitchell, of Philadelphia, the beats were sometimes, not always, slightly increased after taking

it, but in every case they soon sunk below the natural standard, and remained so for some time.

Of the powder of the leaves of uva-ursi, from one to two scruples may be given to most patients; and of a decoction, made from half an ounce of the leaves, boiled for ten minutes in a pint of water, a wine-glass-full may be taken every hour.

Pl. 92.



Citrus Medica?

W. Clark ad. Del.

Waddell Sc.

XCII

CITRUS MEDICA.

The Lemon Tree.

SPEC. CHAR. *Petioles* linear. *Leaves* ovate, acuminate.

Varieties or Modern Species.

C. MEDICA. (*The Citron.*) Branches spiny; petioles naked, leaves oblong, obtuse; flowers with 35—40 stamens; fruit oblong, wrinkled, rind thick, pulp acid.

C. LIMETTA. (*The Lime.*) Petioles subalate, leaves ovate-roundish, serrate; flowers with 30 stamens; fruit globose, with a blunt mastoid apex, a firm rind, and a sweet or acid pulp.

C. LIMONUM. (*The Lemon.*) Petioles subalate, leaves ovato-oblong, very blunt and unequally crenulate; flowers with 25—35 stamens, usually without styles; fruit oblong, with a very thin rind, and a very acid pulp.

Syn.—Malus Medica, *Bauh. Pin.* 435.

Citrus Limon, *Brown Jam.* 309. *n.* 6; Lourier. *Cochin-chin.* 465; *Sloane Jam.* 2. 187; *Lamarck. Illust. t.* 639. *f.* 2.

Lima acris *Ferr. Hesp.* 331. *f.* 333.

Citrus Medica, *Lin. Sp. Pl.* 1100, *Willd.* 3. 1426; *Raii. Hist.* 1654; *Ger. Em.* 1462; *Woodv. t.* 184.

FOREIGN.—*Limonier*, Fr.; *Limone*, It.; *die Limone*, Ger.

THOUGH the Lemon-tree, as well as the Orange, has long been successfully cultivated in the West Indies and the South of Europe, it is, originally, a native of Asia, whence it was brought into Greece and Italy. The citron and the lime were once considered as mere varieties of the Lemon, differing chiefly in the form and qualities of the fruit; but Dr. Roxburgh, in the Hortus Bengalensis, seems to regard the lime as a distinct species, under the name of Citrus *acida*, [now *Limetta*,] and modern authorities distinguish the lemon specifically from the citron, calling the latter *C. Medica*, and the former *C. Limonum*. We, however, have let the old nomenclature remain, as it is the most generally received, and especially as it is at present retained in our national pharmacopœias, and perhaps the fruits are sufficiently distinguished when considered as mere varieties under the names of *Citrus*

Medica Cedra, *C. M.* Limetta, and *C. M.* Limonum. The citrons, lemons, and limes, have linear petioles, wingless, or scarcely dilated at their edges, a character by which they may readily be distinguished from the orange and the shaddock, which have winged leaf-stalks. Both the citron and the lime appear to have been well known to the Romans in the days of Virgil and Pliny; though their propagation and culture were then but little understood. The latter writer, in his 13th book, chap. iii., speaking of fruit trees, says: "I will begin with that, which of all others is the most wholesome, the citron-tree, called also the Assyrian-tree, and by some the Median-apple; the fruit is a counter-poison, and singular antidote against all venom: the leaves, he says, are like those of the arbutus, and the tree is armed with thorns. The pome-citron," he continues, "is not good to be eaten as a fruit, but is very odoriferous, as are the leaves, which are used to be put in wardrobes among apparel, to give a perfume, and to drive away moths and spiders." "This tree," he adds, "bears fruit at all times of the year, for when some fall, others begin to ripen, and some to blossom. Many have tried to transplant the trees into their own country; and for this purpose they have had pots made, and enclosed them well with earth; but for all the care and pains taken about them, to make these trees grow in other countries, yet would they not forget Media and Persia, and liking no other soil, would soon die."

The Lemon-tree is a beautiful evergreen, attaining, in warm countries, the height of twenty feet or more, but in our hot-houses seldom exceeding the size of a large shrub. The leaves are stiff, like those of the laurel; alternate, ovate-oblong, pointed, three or four inches long, of a bright green colour, shining, smooth, serrated or crenulated and the plane articulated with the petiole, which is very slightly winged or without an appendage to the foot-stalk, it being linear. The flowers, which appear the greater part of summer, are large, white, odoriferous, and placed on simple, or branched peduncles, arising from the smaller branches. The petals, calyx, filaments, germen, and other parts of inflorescence, resemble those of the orange, which has been already described. The germen is oval, and becomes an oblong berry, with a nipple-like protuberance at the end; it is externally of a

straw-yellow colour, internally divided into many cells, usually nine, but sometimes only seven or eight, containing four seeds in each, and filled with vesicles abounding in an extremely acid juice. The rind, like that of the orange, consists of two coats, or layers; the exterior coat thin, yellow, and containing, in minute cryptæ, a very fragrant oil; the interior thicker, whitish, and coriaceous. Our figure was made from a specimen which grew in the Botanic Garden, Chelsea.—Fig. (*a*) represents the stamens, &c.; (*b*) the calyx removed to show the germen and style; (*c*) a transverse section of the fruit to show the cells, which, in this individual instance, were eight in number.

Varieties.—The Lemon-tree was cultivated in the Botanic Garden at Oxford in 1648, and is common in our green-houses; where, under proper management, it produces large and ripe fruit. There are several varieties of Lemon, which in our catalogues are usually reduced to two classes: 1. The egg-shaped lemons, with blunt nipples; and, 2. The oblong lemons, with large nipples; to which must be added the monstrous fingered lemon—the *phat-thu* of the Chinese. The most remarkable sub-varieties are the sweet-lemon, plain and variegated; the pear-shaped; the imperial; the lemon called Adam's Apple; the furrowed fruited; the childing; the Gaeta; the wax; the long-fruited; and the lemon with double flowers. The orangeries in this country are supplied, either by plants raised from seed, and budded, inarched, or grafted by our gardeners, or by small budded trees imported in chests from Italy. But it is chiefly the shaddock (Citrus *decumana*, L.) and citron that are thus imported. The *citron*, like the lemon, is a native of all the warmer parts of Asia. The *lime* is also a native of the East, and has long been cultivated in the West Indies on account of its juice, which is esteemed a much more grateful acid than that of the lemon. From one of the varieties, the well-known perfume called *Essence of Bergamot* is obtained, which is said to have derived its name from Bergamo, in Italy, where the variety was first cultivated in Europe, and where it is still preserved.

Lemons are brought to England from Spain and Portugal, packed in chests, each lemon being separately rolled in paper.

Qualities and Chemical Properties.—Lemon-*juice* owes its sour taste to the *citric acid* which it contains, in combination with mucilage, extractive matter, a small portion of sugar, and water. Scheele was the first who obtained this acid in a pure state; his process consists in saturating lemon juice with chalk, an insoluble compound of citrate of lime being precipitated: as much sulphuric acid, previously diluted with six times its weight of water, is then added; lastly, the solution, after being filtered, is set aside, and affords the acid, crystallized in double four-sided pyramids, or sometimes in rhomboidal prisms, which may be purified by repeated solutions, and crystallizations. The acid, thus obtained, has a less agreeable flavour than that of lemon-juice, but as it can be kept in its crystallized state for any length of time, it is generally substituted for it. The citric acid exists also in some other vegetables, and has been obtained in considerable quantities from the unripe fruit of the common gooseberry.

Medical Properties and Uses.—The juice of this fruit is one of the most grateful of the vegetable acids, and is the principal source of citric acid, a very valuable article both for pharmaceutical and culinary purposes. Properly diluted with water, and rendered palatable by the addition of sugar, it forms one of perhaps the most agreeable and refreshing beverages that can be employed to quench thirst and diminish heat in febrile and inflammatory diseases. The juice is also used in the same manner as the acetic acid, in the preparation of effervescing and saline draughts. A draught of this sort made with ℈i of the carbonate of potass, dissolved in one ounce of any aromatic water, and ℥ss of lemon-juice, taken in a state of effervescence, is advantageously employed to check vomiting, and diminish morbid irritability of the stomach. Dr. Whytt found the juice given alone to the extent of a table-spoonful for a dose, to allay hysteria, and palpitations of the heart; and Dr. Bancroft, in his History of Guiana, assures us, that the usual remedy for the bites of poisonous animals, is a cataplasm of the pulp of lemons, mixed with sea-salt, and applied to the wounded part. Like the other vegetable acids, it is also given as a means of counteracting the fatal effects of narcotic poisons, especially opium. As it possesses very remarkable powers in the cure and prevention of scurvy, large quantities of it, in a concentrated state, are generally taken on board ships destined for long voyages. Lemon-juice is given in combination with camphor mixture, cinchona, and aromatic confection, as a useful cordial and antiseptic in gangrenous affections, putrid sore throat, and low fevers. The rind contains a very fragrant essential oil, which is used as perfume, and having a degree of bitterness, it enters into the composition of some stomachic medicines.

Off. Prep.—Syrupus Limonis, L. E. D: Aqua Citri Medicæ, E.
Infusum Aurantii comp. L.
Infusum Gentianæ comp. L. D.
Spiritus Ammoniæ Aromaticus, L. D.
Unguentum Veratri L.

Candied Lemon Peel.—This well-known sweetmeat is made by boiling lemon-peel with clarified syrup, and then exposing it to the air till the sugar crystallizes.

Essential Salt of Lemons.—The preparation sold under this name, for the purpose of removing iron-moulds from linen, consists of cream of tartar and superoxalate of potass, or salt of sorrel, in equal proportions.—*Paris's Pharm.*



Pyrola umbellata

PYROLA UMBELLATA.

Umbel-flowered Winter-green.

Class X. DECANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. BICORNES, *Lin.* ERICEÆ, *Juss. De Cand.* ERICACEÆ, PYROLIDÆ, *Burn.*

GEN. CHAR. *Calyx* in 5-deep segments. *Petals* 5 and biserate. *Capsules* superior, 5-celled, bursting at the angles. *Anthers* opening by two tubular pores.

SPEC. CHAR. *Leaves* wedge-shaped, lanceolate, serrated. *Flowers* somewhat umbellate or sertulate. *Stamens* smooth. *Style* immersed.

Syn.—Pyrola fruticans arbuti folio, *C. Bauh. Pin.* 191; *Tournef. Inst.* 256; *Moris Hist.* 3. *sect.* 12. *t.* 10. *f.* 5.

Pyrola folio arbuti, *Riv. Pent. t.* 139. *f.* 2.

Pyrola 3 fruticans, *Clus. Stirp. Pann.* 507. *Hist. p.* 117.

Chimaphila corymbosa, *Pursh Amer. Sept.* 1. *p.* 300.

Chimaphila umbellata, *Bart. Veg. Mat. Med. U. S. v.* 1. *t.* 1. 17. *Bot. Mag. t.* 778.

Chimaza umbellata, *Brown in Herb. Banks.*

Pyrola umbellata, *Lin. Sp. Pl.* 568; *Willd.* 2. *p.* 622; *Pollich. Palat. n.* 389; *Hoffm. Germ.* 144; *Krocker Siles.* 2. *p.* 14; *Roth. Germ.* 1. 151. *v.* 2. 464; *Mich. Amer.* 1. *p.* 251; *Lam. Encycl.* 5. *p.* 744; *Persoon Synop.* 1. 483.

FOREIGN.—*Pyrole, Verdure d'hiver,* Fr.; *Pirola,* It.; *Das doldenformige Wintergrün,* Ger.; *Vintergrönae, Rylort,* Swed.; *Borowaja trawa,* Russ.

FIVE species of this very natural genus are indigenous to Great Britain. The Pyrola *umbellata* has received a place in our national pharmacopœias; probably on account of the high eulogiums which have lately been bestowed upon it as a powerful tonic and diuretic: but although widely diffused throughout

the northern hemisphere, this species is not found wild in Britain. It inhabits every part of the United States, and extends across the continent to the shores of the Pacific Ocean. It is also found in the forests of Siberia, and in several of the northern parts of Europe and Asia. It delights only in shady woods, particularly of pine and birch, where it is protected from the rays of the sun, and nourished by the soil formed from the decomposition of leaves and other vegetable matter. The common appellations by which it is known in America are *Winter Green, Ground Holly, Rheumatism Weed, and Pippissewa.* It is the most beautiful of all the genus; producing its elegant umbels of cream-coloured flowers in June and July, and continues a long time in bloom.

Michaux, Pursh, and some other botanists, have separated this and another species (*maculata*) from Pyrola, in order to constitute a distinct genus, to which they have given the name of Chimaphila. The former writer remarks, that these two species differ from the others in habit, in having a sessile, undivided stigma, and short-beaked anthers, with a sub-bivalve foramen. Upon these characters Pursh has attempted to establish the genus; but Retzius long ago observed the diversity of the style, which is different in almost every species, "and affords admirable specific, but no generic distinctions."

The genus Pyrola, as now constituted, comprises about 15 or 20 species, principally inhabiting northern countries, both in the new and old world. "In the temperate Zones," says Mr. Don, "they are chiefly met with in mountainous situations; some of the species, such as *uniflora* and *secunda*, extending to considerable elevations. In the frigid Zones, on the contrary, they are only to be found in the lowest and narrowest plains adjacent to the sea, and are never met with in these regions beyond the limit of trees. Most of the species extend across the continents of Asia, Europe, and America. There are specimens of *secunda* and *uniflora* in the Banksian Herbarium, from the islands on the north-west coast of America. The P. *picta* of Smith is found on the north-west coast of America, and in mountainous situations in Japan. Some species, however, are of more limited

diffusion; thus, P. *asarifolia*, *maculata*, and *elliptica*, have only been found in North America. The P. *dentata*, *Menziesii*, and *occidentalis*, are still more confined, being only found in particular districts." * All the species are herbaceous, or somewhat woody, astringent and tonic.

Like most others of this genus, the Pyrola *umbellata* has a long creeping perennial root, sending up woody, somewhat angular, erect, or slightly procumbent stems, at various distances, a span high. The leaves grow in irregular whorls, of which there are generally two or three on each stem. They are lanceolate, wedge-shaped, strongly serrated, smooth, placed on short petioles, and of a deep shining green colour. The flowers, which are usually five, grow in a small corymb, on simple, nodding pedicles: the calyx is inferior, and consists of five roundish, permanent segments, much shorter than the corolla: the petals are five, roundish, concave, spreading, cream-coloured, with a tinge of crimson at the base: the filaments are ten, awl-shaped, curved, supporting large, 2-celled purple anthers; each cell opening by a short, round, tubular orifice at the summit: the germen is roundish, depressed, furrowed, obscurely 5-lobed; the style cylindrical, half as long as the germen, and concealed by the stigma, which is large, peltate, covered with a viscid matter, and obscurely 5-rayed. The capsules are orbicular, depressed, with 5 valves, 5 cells, and 5 partitions from the central column. The seeds are very minute, oval, each contained in a membranous tunic, elongated at both ends.—Fig. (*a*) the anthers separated; (*b*) a seed—from Lamarck.

Qualities and Chemical Properties.—The whole plant, when bruised, has a strong unpleasant odour, and a moderately warm pungent taste, partaking of both sweet and bitter. Alcohol appears to be the best menstruum for extracting the active properties of the plant, although water is capable of separating the greater part of its virtues. The decoction is of a deep brown, and strikes a black colour with the sulphate of iron.

* See a Monograph of the Genus Pyrola, in the *Memoirs of the Wernerian Natural History Society*, by Mr. D. Don, Lib. Lin. Soc.

A Dissertation "De Pyrola umbellata," published at Göttingen, by Dr. Wolf, in 1817, contains an elaborate chemical examination of this plant. As the result of his trials, this author concludes, that 100 parts of Pyrola *umbellata* contain about 18 of a bitter extractive principle, 2.04 of resin, 1.38 of tannin, a slight portion of gum, and the rest fibrous matter and earthy salts. The resin is adhesive, brownish, readily soluble in ether and alkalis, burning with flame and a resinous odour, leaving a white cinder.

Medical Properties and Uses.—As we have no experience ourselves of the medical properties of this plant, we think that our readers will thank us for furnishing them with the opinions of Dr. Bigelow, Professor of Materia Medica, and Botany, in Harvard University, United States: The Pyrola *umbellata* though scarcely known as a medicine until within the last few years, has at the present day acquired a reputation of considerable extent in the treatment of various diseases. Its popular celebrity seems to have originated in its application to the treatment of fever and rheumatism; but the attention of physicians has been chiefly drawn towards its use in other complaints. The instances in which this plant has received favourable testimonies on medical authority, of its successful use, both in America and Europe, are principally the following. 1. As a palliative in strangury and nephritis. 2. As a diuretic in dropsy. 3. As an external stimulant, susceptible of useful application in various diseases.

"In the first of these cases, the Pyrola is entitled to attention and confidence. Some practitioners in this country have employed it with advantage in the same cases in which the Arbutus *Uva ursi* is recommended.* Dr. Wolf, the German writer lately cited, has reported a number of cases of ischuria and dysuria, arising from various causes in which the Pyrola, given in infusion, produced the most evident relief, and took precedence of a variety of remedies which had been tried. His method of administering it was to give a table spoonful of a strong infusion, with a little syrup, every hour. In all the cases he has detailed, small as the dose was, it gave relief in a very short time. In one case its effect was so distinctly marked, that the disease returned whenever the medicine was omitted, and was removed on resuming its use. A tonic operation attended its other effects, so that the appetite was improved, and digestion promoted during the period of its employment.

* See Dr. Mitchell's Inaugural Dissertation. Philadelphia, 1803.

" The diuretic properties of the Pyrola *umbellata,* seem to have been fully illustrated by Dr. W. Somerville in a paper on this vegetable, published in the 5th volume of the London Medico-Chirurgical Transactions. The facts presented by this physician afford satisfactory evidence of the power of this medicine to promote the renal excretion, and to afford relief to patients afflicted with dropsy in its various forms. The most distinguished case presented by him, is that of Sir James Craig, the British governor in Canada, who was labouring under a general dropsy, which in its progress had assumed the forms of hydrothorax, anasarca and ascites, and which was combined with different organic diseases, especially of the liver. After having tried with little or temporary success, almost every variety of diuretic and cathartic medicines, and submitted twice to the operation of tapping, the patient had recourse to a strong infusion of the Pyrola, in the quantity of a pint every twenty-four hours. Although the case was altogether an unpromising one, yet the plant gave relief, not only in the first, but in the subsequent instances of its use. It increased the urinal discharge, and at the same time produced an augmentation of strength, and an invigorated appetite.

" Several other cases of dropsy are detailed in Dr. Somerville's paper, in which the Pyrola was administered by himself and by other practitioners with decided advantage. Dr. Satterly and Dr. Marcet are among those who have added their observations to the testimonies in its favour. Dr. Somerville found his patients to remark, that an agreeable sensation was perceived in the stomach soon after taking the Pyrola, and that this was followed in some instances by an extraordinary increase of appetite. He considers it as having in this respect a great advantage over other diuretics, none of which are agreeable to the stomach, and most of them very offensive to it. He further states, that no circumstance had occurred within his own experience or information, to forbid its use in any form, or to limit the dose.

" Dr. Wolf has given one very satisfactory case of the utility of our plant in ascites. He also found it to alleviate altogether the ardor urinæ attendant on gonorrhea.

" Such are the most important facts which to my knowledge have been published respecting the internal use of the Pyrola *umbellata.* I have administered this plant on various occasions, and attended to its mode of operation. In a number of dropsical cases, when first given, it made a distinct and evident impression on the disease, communicating an increased activity to the absorbents, followed by a great augmentation of the excretion from the kidnies. The benefit, however, with me, has been in most instances temporary, and it was found better to omit the medicine for a time, and to resume it afresh, than to continue it until the system had become insensible to its stimulus. After suspending it for a week or two, the same distinct operation took place on returning to its use, as had been manifested on the first trial. It proved in almost every instance, a very acceptable medicine to the patient, and was preferred both for its sensible qualities and its effects on the stomach, to other diuretics and alteratives which had been prescribed.

" The Pyrola has been considerably employed as an external application in tumors and ulcers of various descriptions. It first acquired notice in consequence of some newspaper attestations of its efficacy in

the cure of cancer. Those persons who know how seldom genuine cancers occur in comparison with reputed ones, will be more ready to allow it the character of curing ulcerous, than really cancerous affections. There are undoubtedly many ulcers, and those frequently of a malignant kind, which are benefited by antiseptic stimulants; and to such the Pyrola may be useful. But of its efficacy in real cancer we require more evidence than is at present possessed, before we ascribe to it the power of controlling so formidable a malady.

"Dr. Millar, of Franklin, informs us that he has used a decoction and cataplasm of this plant with apparent success in various chronic indurated swellings. It acts as a topical stimulant, and when long continued, not unfrequently vesicates. Tumors of long standing have in several instances disappeared under its use."

Sir Walter Farquhar, it appears from Dr. Somerville's paper, had also used the Pyrola *umbellata* in the case of a lady labouring under ascites, in which case the diuretic effects were very striking. The same gentleman likewise states that "the extract was prescribed in three hopeless cases of ascites, accompanied with unequivocal marks of organic visceral derangement: the patients were stimulated powerfully, but in the third the individual complained of sickness at the stomach, and did not persevere in taking the medicine." Dr. Barton, author of "the Vegetable Materia Medica of the United States," also corroborates the accounts of the diuretic effects of this vegetable, by four cases which came under his care at the Marines' Hospital, Philadelphia, in which a strong infusion was given with the most decided advantage. It is said to be a practice in many parts of America to give a bucketful of the decoction to horses that are unable to stale, with the view and uniformly with the effect of relieving them.

As a tonic, the Pyrola *umbellata* has been employed in intermittents, scrofula, and other diseases, where this class of remedies are indicated. Dr. Mitchell, an American physician, relates some cases of its success in these fevers. In one of them, the urine, which was considerably increased in quantity, was of a dark brown colour. Dr. Heberden has recorded a case of a similar colour being produced by the uva ursi. The Indians use a strong and warm decoction of this plant in rheumatism and fever: They employ the whole vegetable, and the decoction is taken in large quantities. Professor Barton says, he has been assured on good authority, that it was very extensively employed, and with excellent effect, in many cases of typhus fever, which under the appellation of "camp-fever," prevailed among the American troops, and carried off great numbers of them during the time of the revolutionary war.

Another species of the genus to which this plant belongs, the Pyrola *rotundifolia*, is said to be used by the Indians as a topical stimulant and vesicant.

The Dublin College directs the following method of preparing the decoction of Pyrola, as recommended by Dr. Somerville:

Pyrolæ umbellatæ ℥j.
Aquæ, mensura ℔ij.

Macerate for six hours, then bruise and return the Pyrola to the liquor, and reduce the mixture by evaporation, when strained and expressed to ℔j by measure.—*Dose* ℥j. to ʒj. three times a day.

Pl. 94.



Coriandrum sativum.

W. Clarke Del.

Weddell Sc.

XCIV

CORIANDRUM SATIVUM.

Common Coriander.

Class V. PENTANDRIA.—*Order* II. DIGYNIA.

Nat. Ord. UMBELLATÆ, UMBELLIFERÆ, *Auct.* ANGELICINÆ, CORIANDRACEÆ, *Burn.*

GEN. CHAR. *Calyx* 5-toothed ; the outer *petals* radiant and bifid, the others obovate and emarginate. *Cremocarp* globose, each mericarp with 5 primary depressed wavy ridges. The secondary ridges more prominent and carinate. *Vittæ* 2 on the commissure ; none in the channels.

SPEC. CHAR. *Fruit* globular, obscurely ribbed, *Leaflets* of the lower leaves wedge-shaped.

Syn.—Coriandrum majus, *Bauch. Pin.* 158 ; *Moris. v.* 3. 269 ; *Riv. Pentap. Irr. t.* 71.

Coriandrum, *n.* 764, *Hall. Hist. v.* 1. 335 ; *Raii. Syn.* 221 ; *Ger. Em.* 1012. *f.* ; *Camer. Epit.* 325. *f.* ; *Bauh. Hist. v.* 3. *p.* 2. 89 *f.* ; *Fachs. Hist.* 345. *f. Matth. Valgr. v.* 2. 121. *f.*

Κορον ἡ κοριαννον, *Diosc. lib.* 3 *cap.* 71.

Κοριανδρον ἡ κουσβαρος hodie.

Coriandrum sativum. *Lin. Sp. Pl.* 367; *Willd. v.* 1. 1448 ; *Fl. Brit.* 320 ; *Eng. Bot. v.* 1. *t.* 67 ; *Fl. Græc. v.* 3. 76. *t.* 283 ; *Woodv. t.* 181. *Mart. Rust. t.* 141 ; *Stokes, v.* 120.

FOREIGN.—*La Coriandre*, Fr. ; *Coriandro*, It. ; *Cilantro*, Sp. ; *Koriander*, Ger. Russ.

CORIANDER is an annual plant, a native of Italy and the East ; but it has naturalized itself in some parts of Essex, where it is extensively cultivated, for druggists and confectioners. It flowers in June and July, ripening its seed in August. We found it growing by the side of the Thames, near the Red House, Battersea, where it had probably sprung from seeds scattered there by Mr. William Anderson, of the Botanic Garden, Chelsea.

The root is tapering: the stem branching, divaricated, leafy, round, striated, purplish at the lower part, and rises twelve or eighteen inches high. The leaves are compound; the lower ones pinnated, with wedge-shaped, acutely notched, or fanshaped leaflets; and the upper thrice-ternate, with fine linear-pointed segments. The flowers are white, or slightly tinged with red, and disposed in umbels at the upper part of the stem. Both general and partial umbels are many-rayed; the former generally consist of 4 or 5 rays, the latter more numerously divided. The general bracteas are almost entirely wanting; but the partial ones are usually 3, linear-lanceolate, and placed laterally. The calyx consists of 5 acute, unequal leaves; the petals are 5 also, inversely heart-shaped, and inflected at the tips; those of the innermost flowers nearly equal and lobed, but those of the margin are irregular, larger, and not inflected. The filaments are thread-shaped, with roundish anthers, and the style spreading with small obtuse stigmas. The fruit is globular, obscurely striated, and divisible into two hemispherical concave mericarps. —Fig. (*a*) is a floret of the radius; (*b*) a floret of the disc; (*c*) the germen and styles.

Qualities.—The leaves and stalk, when bruised, emit an intolerably fœtid odour, greatly resembling that of the insect known under the name of *Pentaloma viridis*, a species of the Linnean genus, Cimex, or Bug, and hence the origin of the generic name Coriandrum, from κορις, *cimex*, a bug. The seeds when fresh have also a disagreeable odour, but by drying they become grateful; to the taste, they are moderately warm and pungent, and have a pleasant aromatic odour. Alcohol takes up all their active principles, but water only extracts them partially. Distilled with water, a small quantity of essential oil is obtained, upon which the active properties of the seeds entirely depend.

Use.—The seeds agree in their medical properties with those of caraway; they are carminative and stomachic, and hence are frequently added to infusions of senna, and to other cathartics; to cover the unpleasant taste, and to obviate the irritating effects they are apt to produce on the stomach and bowels. Formerly, the young leaves were used in salads and in soups; but their scent is disagreeable to most persons. Nevertheless in Peru the natives are so fond of coriander, as a condiment, and use it in such excess to season their food, that Fueillée says an insupportable stench arises from most of their dishes. In small quantities it is not unpleasant, and it forms one of the ordinary ingredients in curry powder.

Dose.—From ℈j. to ʒj. Dr. Withering has known ʒvj. of the seeds taken at once, without any remarkable consequences.



Eugenia caryophyllata.

XCV

EUGENIA CARYOPHYLLATA,

OR

CARYOPHYLLUS AROMATICUS.

The Clove Spice-tree.

Class XII. Icosandria.—*Order* I. Monogynia.

Nat. Ord. Hesperidæ, *Lin.* Myrtaceæ, *Juss.*, *De Cand.* Myrtaceæ, Myrtidæ, *Burn.*

Gen. Char. *Calyx* 4-parted, superior, peristent. *Petals* 4. *Germen* oblong, cylindrical, 2-celled, with many ovules in each cell. *Style* awl-shaped, in the centre of a quadrangular elevation. *Berry* oval-oblong, 12-seeded.

Spec. Char. *Leaves* lanceolate acuminate, entire. *Panicles* axillary and terminal, trichotomous.

Syn.—Caryophylli veri. Clusii, *Ger. Em.* 1533.

Caryophyllum, *Rumph. Herb. Amb.* ii. 3. *t.* 1. 2. 3.

Myrtus Caryophyllus, *Spreng. Syst. Veget. v.* 2, *p.* 485.

Le Gerofle, Sonnerat *Voy. à la Nouv. Gain. p.* 196. *t.* 119.

Caryophyllus aromaticus, *Lin. Sp. Pl.* 735; *Gærtn. de Fract. v.* 1. *p.* 167. *t.* 33; *Lamar. Illustr. t.* 417, *Dict. v.* 2. *p.* 718; *Bat. Mag. n. s. v.* 1. *t.* 2749; *Woodv. t.* 135; *Trans. Soc. of Arts, v.* 20. *p.* 371. *Stokes, v.* 3. *p.* 73.

Eugenia caryophyllata, *Sp. Pl. Wild. v.* 2. *p.* 965; *Ait. Kew. ed.* 2. *v.* 3, *p.* 188; *Thumb. Diss. de Caryoph. aromat. p.* 1. *Jour. de Physiq. tom.* xiv. 47. *t.* 1.

Foreign.—*Le Giroflier*, Fr.; *Il garfano aromatico*, It.; *Il clavo aromatico*, Sp.; *Gewürznäglein*, Ger.; *Givosditschka*, Rus.; *Laong*, Hind.; *Thenghio*, Chin.

The Clove-tree is originally a native of the Moluccas; and the well-known spice was for a long period the staple commodity of Amboyna, one of the principal of these islands. The lucrative trade arising from this valuable article of medicine, or of

luxury, was entirely, and still is principally, in the hands of the Dutch, who guard their monopoly with the most illiberal jealousy. Cloves are only produced in perfection in Amboyna, and the neighbouring islands; but to prevent smuggling, and to make their command of the market more secure, they have been at the utmost pains to extirpate the clove-trees from all the other islands, and to confine the culture of them to Amboyna alone. Notwithstanding, however, the vigilance of the Dutch to secure to themselves a monopoly in this valuable spice, the French obtained some plants, which they carried to the Isle of Bourbon, about the year 1770, and thence to Cayenne, from whence its cultivation has extended to the West Indies. The clove was introduced into the Royal Gardens at Kew, in 1797, by the Right Hon. Sir Joseph Banks.

The clove-spice is produced on a very handsome tree, somewhat resembling a large pear-tree. The trunk is from fifteen to thirty feet high, a foot thick, divided into branches, four or five feet from the ground, which are slender, opposite, usually horizontal, and form a dense, pyramidal head. The leaves are opposite, persistent, somewhat coriaceous, about four inches long, with a strong midrib, and parallel lateral nerves; ovate-lanceolate, quite entire, smooth on both sides, reddish and rather shining above, paler underneath, sprinkled with minute resinous dots, and tapering at the base into a slender foot-stalk, nearly two inches long, which according to Sonnerat is the most aromatic part of the plant. The flowers are odorous, from nine to fifteen or more on a branch, in short terminal panicles, trichotomously divided, and jointed at every division. The calyx, which is superior, consists of four ovate, concave, spreading segments, at first green, but afterwards becoming red. The petals are four, ovate, concave, yellowish-red, larger than the calyx, coherent by their edges, and forming a calyptra which is caducous. In the centre of the calyx, and occupying the top of the germen, is a quadrangular elevated line, into which the stamens are inserted, surrounding the base of the shortish obtusely subulate style. The filaments are numerous, much longer than the petals, bearing small yellow ovato-cordate anthers. The germen is inferior, ob-

long, 2-celled, with twenty ovules in each cell; all of which, as stated by Professor Hooker, become abortive, or *one* or *two* prove fertile, and by their great enlargement destroy the rest of the ovules, and obliterate the distinction of the two cells; so that the fruit, which forms a rather large elliptical purple berry, is only 1 or at most 2-seeded.—Fig. (*a*) represents the petals ready to fall off; (*b*) the petals as they fall off, adhering to form a calyptra; (*c*) a detached petal; (*d*) the petals cohering, the stamens gradually raising them; (*e*) the rudiment of the fruit in a longitudinal section, to show the insertion of the stamens; (*f*) the fruit nearly ripe; (*g*) longitudinal section of the fruit; (*h*) front and (*i*) back view of a stamen; (*j*) vertical section of a berry; (*k*) vertical section of a flower.

The Clove-tree, as we have before observed, is a native of the Molucca Islands; and a short time before the Portuguese took possession of Amboyna, the Cerammers of Cambello secretly carried some seeds in hollow bamboos from Machian, and thus propagated this valuable tree all over Amboyna, Ceram, and the neighbouring islands; and in the space of from fifty to sixty years, the whole of Hoewamoehil was covered with them. This was made known to the Dutch when they first went to Cambello; and some of the first-planted trees were shown to them behind the hill *Massili:* the memory of it is likewise preserved in the traditionary songs of the Amboynese. The brave and enterprising inhabitants of Cambello were rewarded for their candour, by the destruction of all their clove-trees; whereby they were deprived of the fruits of their industrious exertions. The implacable enmity which they in consequence entertained for the Dutch, and their repeated attacks upon the forts, established by the latter, have been stigmatized by Dutch writers as a base and wicked spirit of disobedience; so that Valentyn says, "It would have been better, if, instead of extirpating their trees alone, we had, at the same time, exterminated this revengeful and sanguinary nation."

The islands Honimoa, Oma, and Noussa-lant, commonly called the *Uliassers:* together with Amboyna, were the only spots in which the Dutch East India Company allowed the tree to be

cultivated, and they constantly caused it to be destroyed in every other place within their reach, especially on little *Ceram*, or *Hoewamoehil*, (exclusive of the extirpation which took place from time to time in the Spice-Islands themselves,) that the great abundance of this article, with which the warehouses, both at Batavia and in Holland, groaned, might be moderated.

Thus the Company ordered, in December 1769, that the number of clove-trees should not be allowed to exceed 500,000, and it was further ordered in 1773, that 50,000 more should be destroyed; so that in 1775, after three extirpations, the number of trees, as nearly as could be ascertained, was 513,268. Besides this number, there were 22,310 *tatanamangs*, which are trees planted by the Amboynese at the birth of each child, whereby a rough calculation is made of their respective ages. Although the natives did not oppose the extirpation of the trees in the plantations, when some of their *tatanamangs* were cut down, an insurrection took place, which it was very difficult to overcome.

It is not easy, as Dr. Hooker justly observes, to determine when the Clove was first known to Europeans. J. Bauhin asserts, that the inhabitants of the Moluccas, were scarcely acquainted with the value of the Clove, till some Chinese vessels visited the country, and transported many plants into China, after which they were distributed into other districts of India; into Persia and Arabia. Sir James Smith says, that it does not appear to have been known by the ancient Greeks, and Romans; the first distinct mention of it being by Paulus Ægineta, a Greek physician of the seventh century, as a food and medicine. Sir J. Smith also supposes it to be the *Carunfel* of Serapion, and the *Carunfel bellum* of Avicenna; both of whom were Arabian physicians.

The Clove is now cultivated wherever human industry has carried it to a suitable soil and climate; and numerous other countries besides Amboyna possess this precious vegetable. The French introduced it into the Islands of Mauritius and Bourbon, in 1769; and it has succeeded so well, that in 1802, when M. Bory de St. Vincent was in the Mauritius, he visited the first tree that had been planted by M. Poivre; saw it loaded with Cloves; and as-

certained that it had, in some years, produced the extraordinary quantity of 125 lbs. of this spice; whereas, the average produce in Amboyna is 2 or 2½ lbs. per annum. It requires five thousand cloves to weigh a pound; consequently, there were 625,000 flowers upon this single tree, independently of others which were left for seed; "a fact," says M. St. Vincent, "which would appear incredible, were we not to mention, that this beautiful tree is at least forty feet high, throwing out innumerable branches, some of which, falling down on all sides, form a pyramid of verdure." In 1791, Mr. Hubert, the proprietor of the original spice-estate, gave a fête champêtre in honour of the extended cultivation of the spice-trees; whilst the festivals, annually held by the Dutch in Amboyna, were instituted in commemoration of their destruction in the surrounding islands.

Another French gentleman, M. Céré, sent plants from the Mauritius to Cayenne, about the year 1779; and in 1792 the plantations contained 2,500 trees, which bore cloves equal to those of the East Indies, and fetched a higher price in France than those from the Moluccas. Other plants were sent to Martinique, and the French West India Islands; so that the former furnished the London market, in 1797, with 350lbs.; and the following year with 200 lbs.; at which time St. Kitt's sent 2,981 lbs.

From Martinique, the Clove-tree was introduced to the Island of St. Vincent,* and under the superintendence of Dr. Anderson, at the Botanic Garden, it is brought to great perfection. In Trinidad too, the Clove is extensively cultivated, and there can be but little doubt that it will there become a profitable article of commerce.

The Rev. Lansdown Guilding, who wrote an account of the Botanic Garden in the Island of St. Vincent, says, "that the tree is covered with its lovely blossoms, the greater part of which prove abortive, and falling to the ground, are collected and dried for sale. The berries which remain on the tree, gradually enlarge their calyx and develop the seed, and are gathered under the

* The gold medal of the Society for the Encouragement of Arts, Manufactures, and Commerce, was voted in 1802 to Dr. Anderson, for a communication on Cloves and Cinnamon produced in that island.

trees about July, having turned to a blackish purple, and lost all their value as a spice. The seeds require to be set out immediately and planted near the surface, as they vegetate rapidly. The young plants are tender, and should be placed, if possible, where it is intended they should remain. The Clove was once cultivated to a great extent in Dominique; in our own islands, the trees, which are little valued, produce annually upwards of a million of seeds, besides the abortive fruit, which is dried as spice. The colonists supposing from our overgrown trade with India, that it can never become an article of commerce, neglect even to plant the Clove in their hedges, although it, as well as cinnamon, and many other plants, which any overwhelming change in our Eastern possessions might render invaluable, would grow without any expense."

The clove of merchandize is the unexpanded flower; the corolla forming a ball or sphere on the top, between the teeth of the calyx; and thus, with the narrow base or germen tapering downwards, having the appearance of a *nail;* hence Sir James Smith informs us, the Dutch call it *Naghel;* the Spaniards *Clavo;* the Italians *Chiodo;* and the French *Clou*, from which the English *Clove* is evidently derived.

Cloves are gathered by the hand, or beaten with reeds, so as to fall upon cloths placed under the tree; and dried by fire, or what is better, in the sun. The fully-formed berries are preserved in sugar, and eaten after dinner to promote digestion.

The cloves at present entered for home consumption in Great Britain amount to about 60,000 lbs. a year, of which a part comes from Cayenne; but the cultivation of the clove in Cayenne and in the West Indies depends entirely on the existence of the present system in the Moluccas. The superiority which the latter enjoy over every other place in the production of cloves is so great, that were any thing like freedom given to those engaged in the cultivation, they would very speedily exclude every other purveyor from the market.

Qualities.—The bark, fruit, roots and leaves of the clove spice-tree are all more or less aromatic. The cloves of commerce have a strong aromatic odour, and a warm pungent taste. In-

fused in water, they give out to it more of their smell than to spirit, but not so much of their flavour. Alcohol takes up all the virtue of cloves. By distillation with water, they yield a fragrant essential oil, which is not very pungent; but which is said to be generally rendered acrid, by a portion of the resinous extract obtained by the action of alcohol on cloves being dissolved in it.

Cloves should be chosen large sized, perfect in all parts, heavy, of a fine fragrant smell, and hot aromatic taste, so as almost to inflame the throat; the colour should be dark-brown, almost approaching to black, and when handled should leave an oily moisture on the fingers. When *fresh gathered*, cloves will yield, on simple pressure, a fragrant, thick, reddish oil. Sometimes they have a considerable portion of their essential oil drawn from them, and are then mixed with those that retain it. By this mixture the purchaser may be deceived; but on examination, those cloves which have lost their virtue, always continue weaker than the rest, and of a paler colour; and whenever they look shrivelled, having lost the knob at the top, are all light or broken, with but little smell or taste, they should be rejected. As cloves readily absorb moisture, it is not uncommon, when a quantity is ordered, to keep them near a vessel of water, by which means a considerable addition to their weight is made. The ton is 12 cwt. for freight.

When new, *oil of cloves* is of a pale reddish brown colour, (which becomes darker by age,) extremely hot and fiery, and sinks in water. The kind generally exported from India, contains nearly half its weight of an insipid expressed oil, which is discovered by dropping a little into alcohol; when, on shaking it, the genuine oil mixes with the spirit, and the adulteration separates. It is sometimes adulterated with a cheaper essential oil: to discover this, dip a rag into it, and hold it before the fire; the flavour of the genuine oil will fly off, leaving that of the added behind.

Medical Properties and Uses.—Cloves are generally conceded to be the most stimulating of aromatics, and are chiefly employed to impart a pleasant flavour, or to correct the irritative

properties of drastic medicines. The essential oil is sometimes added to extracts for the same purposes, and is a popular remedy for tooth-ache. The infusion of cloves is a warm and grateful stomachic, and is advantageously employed to "relieve the sense of coldness in the stomach, which attends some forms of dyspepsia," especially when arising from the abuse of ardent spirits, from chronic gout, or flatulent colic. The Dutch join it with cinchona and supertartrate of potass, in obstinate agues. Twenty cloves are added in powder to half an ounce of each of the other ingredients, and half a drachm is given every third or fourth hour. In dyspepsia, and as a vehicle for other medicines, ʒij of cloves are infused in half a pint of boiling water, and administered in the dose of an ounce and a half, or two ounces. The essential oil is made into an agreeable draught by diffusing it in water, with mucilage; and an aromatic syrup is sometimes made from the clove, and coloured with cochineal. Cloves are used in their native climate, and in almost every part of the civilized world, as an article of luxury, communicating a pleasant flavour to preserved fruits, sauces, ragouts, and liqueurs. They are likewise employed by the perfumer.

Dose.—In substance, from gr. v. to gr. x.

Off. Prep.—Infusum Caryophyllorum, L. D.

Pl. 96



Zingiber officinale

XCVI

ZINGIBER OFFICINALE.

Narrow-leaved Ginger.

Class I. MONANDRIA.— *Order* I. MONOGYNIA.

Nat. Ord. SCITAMINEÆ, *Lin. Brown.* CANNÆ, *Juss.* DRYMYRRHIZEÆ, *Vent., De Cand,* &c. ZINGIBERACEÆ, *Richard.* SCITAMINEÆ ZINGIBERACEÆ, *Burn.*

GEN. CHAR. *Anther* 2-lobed. *Filament* elongated beyond the anther with an acuminate, channelled beak, embracing the style. The *labellum* simple.

SPEC. CHAR. *Leaves* linear-lanceolate. Inflorescence in compact strobiliform, ovate spikes. *Bracteas* acute, segments of the outer limb of the corolla linear, revolute. Middle lobe of the lip entire. *Nectary* or *labellum* 3-lobed.

Syn.—Zingiber, *Browne's Jam.* 119; *Sloane's Jam.* 1. *p.* 163.
Zingiber majus, *Rumph. Amboin. v.* 5. 156. *t.* 66. *f.* 1.
Ischi, *Reede Hort. Malab. v.* 11. 21. *t.* 12.
Amomum Zingiber, *Lin. Sp. Pl.* 1; *Willd. v.* 1. 6; *Jacq. Hort. Vind. v.* 1. 31. *t.* 75; *Roscoe in Lin. Soc. Trans. v.* 8. *p.* 347.

FOREIGN.—*Gingembre,* Fr.; *Zenzero,* It.; *Ingwer,* Ger.

THE Ginger plant is a native of the East Indies, and of various parts of Asia, but is now extensively cultivated in the warmer parts of America, and in the West Indian Islands, from whence it is chiefly imported into Europe. It is a stove plant in England, flowering in September, and is said to have been raised here by Edward Lord Zouch, before the year 1605.

The root stake is perennial, tuberous, fleshy, of a compressed roundish form, covered with an ash-coloured tegument, and sending off many stout fibres. The whole herb is smooth, and partakes of the hot, gratefully aromatic flavor of the root. The *barren* stems are several, upright, annual, herbaceous, wand-like, round, leafy, and about three feet high. The leaves are alternate, linear-lanceolate, acute, entire, single-ribbed, spreading, with long,

close, sheathing, abrupt foot-stalks. The *flower-stalks* are radical, a foot high, and clothed with tubular sheathing bracteas. The spikes are solitary, erect, club-shaped, enveloped in broader, shorter, less pointed, crowded bracteas, each accompanied by a solitary, sessile flower, twice its own length, of a delicate texture, and short duration. The corolla is monopetalous, tubular, and cut into three unequal acute segments: the outer limb of a very pale yellow, or straw-colour, revolute; the upper segment rather the broadest, having the lip spotted with crimson. There is only one filament, which is extended beyond the anther; and has an awl-shaped, channelled beak, embracing the style. The germen is inferior, roundish; style thread-shaped, embraced by the filament, and scarcely extending beyond its beak: stigma small, projecting a little beyond the beak. The capsule is smooth, containing many seeds. *Fig.* (*a*) represents the outer bractea; (*b*) the inner bractea and flower; (*c*) the anther and style; (*d*) the lip.

The Greek name for ginger, Ειγγιβερ, is evidently derived from *Zungebeel*, its Persian appellation; and as it is indigenous at *Gingi* in China, it is supposed by some persons to have obtained its English name from that place, although *zingiber* and *ginger* are so much alike, that the one might be not improbably assumed to be a corrupted derivative of the other.

Ginger is a native of many eastern countries, but it is no where to be found, says Ainslie, of a finer quality than on the coast of Malabar. It is the *ischi* of the Hort. Malab. (11. p. 21. t. 12,) and the *zingiber majus* of Rumphius (Herbarium Amboinense, pars. 5. p. 156. t. 66. f. 1.)

This plant was introduced into New Spain by Francisco de Mendoza; from whence it was carried to the West Indian Islands, where it grows so plentifully, particularly in Jamaica, even in a wild state, as to induce a belief that it was indigenous to the soil. Since its introduction into Jamaica, it has become an article of considerable export; for which purpose it is generally cultivated. It is calculated that about one million pounds of it are annually consumed in Europe.

Ginger was known in England in Queen Elizabeth's reign, as

Gerarde says, "Our men which sacked Domingo in the Indies digged vp ginger there in sundry places wilde." He adds, "Ginger groweth in Spaine, in the Canarie Islands, and the Azores. It is most impatient of these our northern regions, as myself haue found by proofs; for that there haue been brought vnto me at seuerall times, sundry plants thereof, fresh, greene, and full of iuice, as well as from the West Indies, as from Barbarie, and other places; which haue sprouted and budded foorth greene leaues in my garden in the heate of somer; but as soon as it hath bin but touched with the first sharp blast of winter, it hath presently perished, both blade and roote."

It appears to have been known in London about the year 1566-7, and was evidently introduced by the Dutch; as Gerarde states that about thirty years or more, before he published his account, (1597,) "an honest and expert apothecarie William Dries, to satisfie my desire, sent me from Antwerpe to London, the picture of ginger, because I was not ignorant that there had been oft ginger rootes brought green, new, and full of iuice, from the Indies to Antwerpe: and further, that the same had budded and grown in the said Dries' garden."

Experience shows that in situations where ginger is extensively grown, that when the stalks are wholly withered, the roots are fit to take up, which is generally in January or February. Being picked and cleaned, they are gradually scalded in boiling water: after this they are spread, and exposed to the sun, till the whole is sufficiently cured; they are then divided into parcels of about one hundred weight each, and put into bags for the market: this is called *black ginger*. The *white* is never scalded, but every root is picked, washed, and scraped separately, and then dried in the sun and air. The bleached ginger, now so much esteemed, owes its whiteness to the action of chlorine; and although a more elegant, or rather a more delicate looking spice, it is far less aromatic than the ordinary white or black sorts.

To preserve this root in syrup, it is dug when the shoots do not exceed five or six inches in height. Being picked and washed, they are scalded till tender: then put into cold water, and scraped and peeled gradually: this operation may last three or four days, during which time the roots are kept in water, constantly renewed. They are then put into jars, and covered with a thin syrup, which after two or three days is shifted, and a richer put on: this is sometimes again removed, and even a fourth occasionally employed; but it seldom requires more than three syrups. The shifted syrups are diluted, and fomented into a pleasant liquor, called *cool drink*.

Ginger should be chosen in large roots, new, not easily broken, of a light brownish green colour, and of a hot, pungent, aromatic taste. That which is small, dark coloured, soft, or very fibrous,

should be rejected. It is sometimes imported *green* from the East Indies. In freight, 16 cwt. of dry, and 20 cwt. of green ginger, are allowed to a ton.

Chemical Analysis.—According to the experiments of M. Morin, ginger contains a resinous and subresinous matter, a dark blueish green essential oil, acetic acid, acetate of potash, osmagome, gum, some vegeto-animal matter, sulphur, starch, and lignin. In Jamaica ginger the starch is very abundant.

Qualities.—The active matter of this root is yielded to alcohol, and in a great measure to water. It affords, by distillation, a small quantity of essential oil, upon which the flavour of ginger depends; while its pungency appears to reside in a resino-extractive matter, united with a great quantity of starch, which constitutes the chief bulk of this valuable condiment.

Medical Properties and Uses.—This root, which is stimulant and carminative, is principally employed as an adjunct to other remedies; to augment their efficacy, or to obviate their griping effects: and is often administered, in substance or in infusion, for flatulent colic, tympanites, and some forms of dyspepsia. It also acts as a sialogue, when chewed: tooth-ache is therefore sometimes relieved by it, and by many persons it is recommended in relaxations of the uvula, and tonsils, and in paralysis of the muscles of the tongue and fauces.

We are informed by Dr. Ainslie, that Europeans in India, of delicate constitutions, frequently use an infusion of ginger in place of common tea, and the natives eat it freely in salads. In China green ginger is commonly seen in the vegetable markets, and is there eaten as a common potherb.

Dose.—From ten grains to a scruple, in powder.

Off. Prep.—Acidum Sulphuricum aromaticum. *E.*
Confectio Opii. *L.*
———Scammonii. *L. D.*
Infusum Sennæ. *L.*
Pilula Aloes. *D.*
Pilula Scillæ comp. *L.*
Pulvis Cinnamomi comp. *L. E. D.*
——— Scammonii comp. *L. D.*
——— Sennæ comp. *L.*
Spiritus Ætheris aromaticus. *L.*
Syrupus Rhammi. *L.*
———- Zingiberis. *L. E. D.*
Tinctura Cinnamomi comp. *L.*
———- Rhei comp. *L.*
———- Zingiberis. *L. D.*
Vinum Aloes. *L. E. D.*

* Sinclair's *Code of Health*, vol. i. p. 233.

Pl. 97.



Anthemis Pyrethrum.

c

Weddell Fecit.

ATHEMIS PYRETHRUM.

Spanish Chamomile, or *Pellitory of Spain.*

Spec. Char. *Stems* simple, 1-flowered, decumbent; *leaves* bipinnated, segments linear, pointed.

Syn.—Pyrethrum officinarum, *Ger. Em.* 758. 1; *Park.* 858. *n.* 2. 859. *f.* 2.
Pyrethrum flore bellidis, *Bauh. Pin.* 148; *Raii Hist.* 353.
Chamæmelum specioso flore, radice longa fervida, *Shaw. Afric.* 138.
Anthemis Pyrethrum, *Lin. Sp. Pl.* 1262; *Willd. v.* 3. 2174; *Woodv. v.* 2, *t.* 104; *Curt. Bot. Mag. v.* 13. *t.* 462.

Foreign.—*Pyrèthre*, Fr.; *Piretro*, It.; *Anthemis pelitri*, Sp.; *Bertram Wurtzel Zahn Wurtzel*, Ger.; *Akkaracarum*, Tam.; *Akurkurha*, Arab.

Pellitory of Spain is a perennial plant, a native of the Levant, Syria, Arabia, Barbary, and the south of Europe. It has long been celebrated as a medicinal agent; and merits a place in our collections, on account of the beauty both of the foliage and flowers: it is a very rare plant in this country, notwithstanding it was cultivated here, by Lobel, as long since as 1570. Parkinson, it appears, grew it; as he observes, that the roots of the cultivated plants were much larger than those of the wild ones: he tells us also, that it was too tender to endure our winters; and to the latter cause, as well as to the difficulty of propagating it, for it does not ripen its seeds in this country, its present scarcity has been attributed.

The root is long, tapering, about the thickness of a finger, which runs down a foot or more into the ground, with a brownish cuticle, and sending off several small fibres. From the root proceed several procumbent stems, about a foot in height, round, hairy, commonly unifloral, and seldom branching. The leaves are doubly pinnate, with narrow linear segments, of a pale green colour. The flowers appear in June and July; they are large, terminal, solitary, with the florets of the disc yellow, and those of the radius white on the upper side, and of a purplish colour

underneath. The florets resemble those of Anthemis *nobilis*; in the centre, or disc, they are united; those of the circumference, margin or radius, are pistilline, that is, have no stamens, at least in perfect condition; and hence, as the flowers of the disc are sufficient to perpetuate the species, the extra pistilliferous ones of the ray were said by Linnæus to be *superfluous*. Fig. (*a*) and (*b*) represent a front and back view of a floret of the radius; (*c*) a floret of the disc; (*d*) the style; (*e*) the stamens.

Chemical Analysis.—M. *Gouthier* says, that in 100 parts of the root of this plant he found—

Oil, fixed	5
—- Volatile	a trace
Yellow colouring matter	14
Gum	11
Muline	33
Muriate of lime	a trace
Lignin	35
Moss	2
	100

Qualities.—The dried root of Pellitory has no smell. On being chewed, the taste, which is acrid, is not immediately perceived, but it quickly raises a glowing heat, and a plentiful secretion of saliva. Grew says, "The heat produced by Pyrethrum is joined with a kind of vibration, as when a flame is brandished with a lamp furnace . . . Being chewed, it makes a sensible impression on the lips, which continues (like the flame of a coal betwixt in and out) for nine or ten minutes; but the heat in other parts much longer.* This heat is by no means so painful as that which the arum, capsicum, and some other plants produce. Alibert says, "Par la distillation, cette racine fournit une huile butyracée très acrimonieuse;" and it is on this oil, which is deposited in vesicles on the bark, that its pungency depends. It is completely extracted by alcohol and sulphuric ether.

Medical Properties and Uses.—This root is a powerful stimulant; and if applied in its recent state to the skin, it produces inflammation and vesication, like Mezereon. ‡ Dioscorides commended it for tooth-ache, for which it is still beneficially employed by us; and by him and the Arabian physicians it was prescribed for rigors.

The Persians and Moguls consider it to be discutient and attenuant; and the Vytians prescribe an infusion of it, in conjunction with other medicines, as a cordial and stimulant in lethargic cases, in palsy, and in certain stages of typhus fever. In consequence of the immense flow of saliva that it is capable of producing, "inflammations and congestions of the neighbouring parts are relieved. Hence it has been found useful, when chewed, in some kinds of head-ache, chronic ophthalmia, and rheumatic affections of the face, and, by its direct stimulus, in paralysis of the tongue and muscles of the throat." This drug is often adulterated with the roots of *Achillea Ptarmica* and *Chrysanthemum frutescens*.

* Grew, of tastes. ‡ Bergius.



Pastinaca Opopanax

PASTINACA OPOPONAX,

OR

OPOPONAX CHIRONIUM.

Opoponax, or *Rough Parsnip.*

Class V. PENTANDRIA.—*Order* II. DIGYNIA.

Nat. Ord. UMBELLATÆ, *Lin.* UMBELLIFERÆ, *Juss.* ANGELICINÆ, ANGELICACEÆ, *Burn.*

GEN. CHAR. *Fruit* elliptical, compressed nearly flat, with 3 prominent dorsal ribs, and 2 nearly obsolete marginal ones: the vittæ of the vallecules 3, those of the commissure 6-10. *Petals* entire, involute, equal. *Calyx* very minute, the margin obsolete. *Flowers* regular, uniform, fertile.

SPEC. CHAR. *Leaves* bipinnate; leaflets unequal at the base; scabrous on both sides.

Syn.—Panax Costinum, vel P. pastinacæ folio, *Bauh. Pin.* 156.
Panax Heracleum majus, *Ger. Em.* 1003.
Panax Heracleum, *Moris, v.* 3. 315. *sect.* 9. *t.* 17. *f.* 1.
Panax Chironium, *Dalech. Hist.* 741.
Panax peregrinum, *Dod. Pempt.* 309.
Costus, *Matth. Valgr. v.* 1. 48.
Pseudocostus, *Camer Epit.* 28; *Dalech. Hist.* 758.
Sphondylio, vel potius Pastinacæ Germanicæ affinis Panax, sive Pseudo. Costus flore luteo, *Bauh. Hist. v.* 3. *p.* 2. 156.
Pastinaca Opoponax, *Lin. Sp. Pl.* 376; *Willd. x.* 1. 1466; *Woodv. t.* 113; *Fl. Græc. Sibth. v.* 3. *t.* 288.
Πολύκαρπον, ἢ αμπελόνα, hodié.

THIS is a hardy, umbelliferous exotic, a native of the Levant, Turkey, Arabia, Sicily, and the south of Europe; which has long held a distinguished place in the Materia Medica, as affording the gum-resin, called Opoponax. The plant withstands our winters, in the southern counties, well; flowering in June and July; but it is only in the warmer regions of the east that

the juice concretes into the appearance which it presents to us, when imported from Turkey and India. It grows abundantly in Achaia, Bœotia, and Phocis in Macedonia; hence it is figured in Sibthorp's Flora Græca, v. 3. t. 285.

The root is perennial, branched, as thick as the human arm, fleshy, tapering, of a yellowish colour, tubercled, and covered with a corky bark. The stem rises six or seven feet in height, the thickness of a man's finger, round, leafy, striated, and scariose at the base, with numerous angular, smooth, shining, hairy branches, towards the summit. The leaves are very large, petioled, veiny, rough on both sides, with the petioles sheathing, more or less hairy, and acutely serrated; those of the root simple, cordate, and crenated: the stem-leaves are pinnate, composed of many pairs of oblong, serrated, veined leaflets, with the terminal leaflet cordate, and very large. Both the involucres and involucels consist of from four to six very small linear leaflets, which are sometimes altogether wanting. The flowers are numerous, small, of a greenish yellow colour, and produced in erect, terminal flat umbels; on very smooth stalks, and are composed of several rays, with opposite linear, oblong, sub-entire, smooth bracteas, under each general umbel. The flowers are all uniform, and generally prolific; the limb of the calyx very minute; the petals five, involute, entire, equal; the stamens thread-shaped, spreading, with roundish anthers; the germen roundish; the styles short, erect; the fruit elliptical, roundish, compressed, striated, almost flat, with three dorsal ribs, and two reduced marginal ones forming a thin border; seeds of the same form as the fruit. Fig. (*a*) represents a flower magnified.

Qualities and Chemical Properties.—Opoponax, which is obtained by wounding the roots of the plant, is of a tolerably firm texture, usually in small grains, but sometimes in large masses, formed by a number of grains, connected with a matter of the same kind. The masses are generally loaded with foreign substances, and are much inferior to the pure loose drops. The finest is in grain from the size of a pin's head, to that of a large pea. The internal colour of these grains is a pale yellow, frequently mixed with white, and externally they incline to a

red, or orange colour. They are moderately heavy, of a somewhat fat or unctuous appearance, smooth on the surface, of an acrid bitter taste, and a strong disagreeable smell. Opoponax should be chosen in clear pieces, with the before-mentioned qualities. Such tears as are black, and too hard, should be rejected. The masses, or cakes, are usually of a black colour, and full of sticks and straws. Freight, 16 cwt. to a ton. With water it forms a milky solution, and about one-half of it dissolves. Alcohol acts but feebly. When dissolved with water or alcohol, these liquids acquire its flavour, but no oil separates.* Its specific gravity is 1·622.†

When distilled, it yields a brown oil, and acetic acid, in which a bituminous oil swims: the residual charcoal weighs $\frac{28}{100}$ of the Opoponax distilled. When incinerated, it left $\frac{37}{280}$ of its weight of ashes, composed of

Carbonate of lime	18
Silica	2
Carbonate, Sulphate, Muriate of potash	15
	35

According to the analysis of Pelletier, to whom we are indebted for the preceding distillation, Opoponax is composed of the following constituents:—

Resin	42·0
Gum	33·4
Wood	9·8
Starch	4·2
Malic acid	2·8
Extractive	1·6
Caoutchouc	*Trace*
Wax	0 3
Volatile oil, and loss	5·9
	100·0‡

* Neumann's Chem. p. 316. † Brisson.

‡ Ann. de Chim. lxix. 90.

Medical Properties.—This plant, which, according to Dierbarch, is the Πηρακλειον of Hippocrates, was held in high repute by the ancients, especially by Celsus, who administered it in affections of the spleen and in struma ;* but although, according to Virey,† it is considered by the continental physicians as "bon discussif, resolutif, chasse les vents, attenue dans l'asthme et les obstructions," it is scarcely ever used in England. It has, however, been regarded as antispasmodic and emmenagogue, and has been given for hysteria and chlorosis, in doses of from five grains to half a drachm, but might, we consider, be expunged from our materia medica, as an article of little medical value.

* Lib. v. cap. xviii. † Hist. Nat. des Méd. p. 220.



Rosa Gallica.

ROSA GALLICA.

Red Officinal Rose.

Class XII. Icosandria.—*Order* I. Polyginia.

Nat. Ord. Senticosæ, *Lin.* Rosaceæ, *Juss. De Cand,* &c. &c.

Gen. Char. *Calyx* pitcher-shaped, 5-cleft, finally pulpy, contracted at the neck. *Akenia* numerous, hispid, affixed to the inner side of the tube of the calyx.

Spec. Char. *Leaflets* rigid, elliptical, smooth. *Prickles* of the stem uniform, slender; *flower-stalks* stiff, erect. *Calyx* ovate. *Fruit* subglobose.

Syn.—Rosa rubra, &c. *Bauh. Hist.* 2. 34.
R. centifolia, *Mill. Dict. n.* 14; *Willd. Sp. Pl.* 2. 1171; *Pers. Syn.* 2. 48.
R. sylvatica, *Gater. Montaub.* 94.
R. rubra, *Lamarck, Fl. Fr.* 3. 130.
R. holosericea, *Röss Ros. t.* 16.—Damascena rubro purpurea, *ibid. t.* 18.
R. belgica, *Brot. Luist.* 1. 338.
R. cuprea, *Jacq. Fragm.* 31. *t.* 34. *f.* 4.
R. pumila, *Bauh. Hist.* 2. 35; *Willd. Sp.* 2. 1072.
R. austriaca, *Crantz Austr.* 86; *Poll. Palat.* 50.
Rosa, n. 1104. *Hall. Helv.*
R. gallica, *Lin.*; *Sp.* 704; *Willd. Sp.* 2. 1071; *Redouté les Roses, tom.* 1. 73. *t.* 25.—135. *t.* 52.—2. 17. *t.* 7.—19. *t.* 8. 10. *Bot. Reg. v.* 6. *t.* 448.

Foreign.—*Fleurs des Roses rouges,* Fr.; *Rosa domestica,* It.; *Essig-rosen,* Ger.

This species of rose is a native of the south of Europe, but is common in our gardens, and flowers in June and July. In its cultivated state, it is scarcely three feet high, sending up, from its creeping roots, many stems, armed with fine, dispersed, short, straight prickles. The leaves consist of two or three pairs of leaflets, with a terminal one attached on very short petioles to

a common foot-stalk ; the leaflets are ovate, rigid, doubly serrated, smooth, of a fine rather shining green colour on the upper surface, pale, downy, or hairy underneath. The stipulas are linear-lanceolate, pointed, entire, downy and glandular. The flowers consist of a few large spreading petals, of a deep peculiar rich crimson colour ; their base, like the stamens, of a fine gold colour, and stand on stiff, erect peduncles. The segments of the calyx are downy, sometimes fringed at the margin with a row of linear-lanceolate leaflets, as if pinnate : the stamens are numerous, bearing roundish yellow anthers ; the germens are also numerous, with villose styles, united into a cylinder. The fruit is subglobose, and of a pale crimson colour.

In a work, professedly scientific, a long dissertation on this flower of Love and Poetry cannot reasonably be expected. We must not, however, pass over unnoticed some of the fables and allegories with which it is connected, lest some of the ladies who patronize our undertaking should consider us as devoid of proper taste.

The name Rosa is supposed to be derived from the Celtic, *rôs*, or *rhos ;* from whence proceeds its Greek synonym, *ῥοδον*. De Theis considers that the Celtic *rhodd,* or *rhudd*, red, is the primary root of these words, the rose colour being almost synonymous with redness. Hence also came *rhus*, *rubia*, *rubus*, and the Greek name of the *pomegranate*, *ῥοα*, or *ῥοδια*, still in use. From the beauty of the genus, the rose is dedicated to Venus, the goddess of love and beauty. Thus Berkeley, in his Utopia, describes a lover as declaring his passion by presenting to the fair beloved a rose-bud, just beginning to open ; if the lady accepted and wore the bud, she was supposed to favour his pretensions. As time increased the lady's affection, he followed up the first present by that of a half-blown rose, which was again succeeded by one full-blown ; and if the lady wore this last, she was considered as engaged for life. In some parts of Sussex, it is customary for the domestics to welcome a bride, by strewing the path with roses, on her first appearance ; and in Surrey, in the time of Evelyn, it was the custom to plant roses round the graves of lovers. The Greeks and Romans observed this practice

so religiously, that it is often found annexed as a codicil to their wills, as appears by an old inscription at Ravenna, and another at Milan, by which roses are ordered to be yearly strewed, and planted upon graves. In South Wales it is also the universal practice to strew roses and other flowers over the graves of departed friends. As an emblem of youth, the rose was dedicated to Aurora, and as an emblem of fugacity, to Cupid; no doubt from its short-lived beauty, which has been a fruitful theme for poets, as in Crashaw's lines on the death of Mr. Herrys: an instance also occurs in Mr. Bowring's translation from the Russian of Kostrov; and in Canto 16, of Tasso's *Gerusalemma Liberata.*

The rose was given by Cupid, as a bribe to Harpocrates, the god of Silence; from whence, we should suppose, originated the custom, which, according to Rosenbergius, prevailed among the northern nations of Europe, of suspending a rose from the ceiling over the upper end of their tables, when it was intended that the conversation which took place should be sacred to secrecy: and it is this custom which undoubtedly gave rise to the common expression, "under the rose."

The ancients tell us, that roses were originally white; but were changed to red by the blood of Venus, when her feet were lacerated by their prickles in her attempt to protect Adonis from the rage of Mars. Theocritus and Bion, however, are of opinion that it was the blood of Adonis himself that changed their colour. Another fable relates, that Cupid, leading a dance in Heaven, stumbled and overset a bowl of nectar, which falling upon the earth, stained the rose; while Ausonius has caused the rose to blush, from the blood of Cupid. Busbequius informs us that the Turks superstitiously believe that roses originated from the sweat of their prophet Mahomet. Monkish writers also have enlisted roses into the service of their theology. Marubius tells a story of a virgin named Dorothea, who suffered martyrdom in Cæsarea under the government of Fabricius; and who converted a scribe named Theophilus to Christianity, by sending him some roses in the winter-time out of Paradise.

A golden rose was considered so honourable a present, that

none but crowned heads were thought worthy either to give, or to receive it. Roses of this kind were sometimes consecrated by the Popes upon Good Friday, and given to such potentates as it was their particular interest to propitiate. The flower itself they considered an emblem of the mortality of the body, and the metal of which it was composed, of the immortality of the soul. Boëthius says, that William, King of Scotland, received a present of this sort from Pope Alexander the Third; and Henry the Eighth is recorded to have had a similar gift from Alexander the Sixth. The seal of Luther, which is a rose, is supposed to be symbolical of the same things, as those golden presents were. Roses were also employed by the Roman emperors as a means of conferring honours upon their most famous generals, whom they allowed to add a rose to the ornaments of their shields; a custom which continued long after the Roman empire had ceased to exist, and the vestiges of which may yet be traced in the armorial bearings of many of the ancient noble families of Europe.

We have already hinted, that owing to the great variety of roses, it has become a task of almost insurmountable difficulty to determine which is a species, or which a variety; and although Lindley has written a monograph on the Genus, much remains to be accomplished to satisfy the mind of the scientific botanist, and to reconcile the differences existing in his and Sir J. Smith's opinions. To prove the truth of our remarks, we need only state that the R. *Gallica* is considered by some to be a variety of the R. *pumila* of Jacquin; that the R. *centifolia* and R. *provincialis* are identical; while Sir J. Smith ranks the *hundred-leaved* rose as a variety of R. *Gallica*. The hundred-leaved rose has been very generally confounded with a distinct species, the R. *Damascena*, and unless the mistake be corrected in the last edition of the Dublin Pharmacopæia, of which we cannot obtain a sight, it will be seen that the error is still propagated by a very learned body.

As objects of cultivation, roses have always been eagerly sought after, and for the purpose of increasing their beauty, every means has been adopted, that would be likely to render

them double. Hence we may account for the multitude of individuals with which every garden abounds; whose beauty is only equalled by the extreme difficulty of tracing them to their original stocks. And we may go back to the times of Herodotus, Athenæus, and Theophrastus, each of whom adverts particularly to double roses; while Pliny enumerates several sorts, amongst which is the R. *centifolia*.

Geographically considered, the species are all included between the 70th and 20th degrees of northern latitude; except the R. *Montezuma* of Mexico, found in 19° N., at an elevation of more than 9,300 feet above the level of the sea. But Baron Humboldt has calculated that in tropical countries the decrement of caloric is one degree for every 9° toises of vertical elevation; therefore the heat at this height would be nearly the same as that of countries 29° further from the equator; so that its situation is essentially the same as that of the European parallel, to the species of which it is the more readily related than to those of its own continent. In Asia half the species have been found. Of the thirty-nine it produces, eighteen are natives of the Russian dominions and the countries adjacent. Most of them are similar to the European portion of the genus, and five are common to Europe and Asia. Of the remainder, one, which is perhaps a distinct genus, has been discovered in Persia, fifteen in China, and two of the latter with four others, in the north of India; one of which has considerable affinity to the R. *moschata* of Northern Africa. The Chinese and Indian species have a habit entirely different from the rest. It is from Asia, which may indeed be called the "land of the rose," that the greatest number of novelties are to be expected. With the roses of the Crimea we are impefectly acquainted; and yet they are said to grow there in the most astonishing profusion. Europe has twenty-five species; of which 5-sixths exist between 40° and 50°. Britain, according to Smith, has twenty-two species; Denmark has seven; Holland, thirteen; whilst in Spain, Portugal, and the Levant, only four species have been observed. In the north of Africa there are two species peculiar to that country, and two others common to it, and Europe. Fourteen species have been

found in North America, only two of which, *Montezuma* and *stricta*, bear much general resemblance to European roses. The R. *lævigata* of the woods of Georgia is so similar to the R. *Sinica* of China, as not to be immediately distinguished from it; and the latter is even sold in some of the London nurseries under the name of R. *Cherokeensis*.

Qualities.—The petals of the unblown buds are the parts medicinally used. They give out their virtues both to water and rectified spirit, and tinge the former of a fine red colour, but the latter of a very pale one. The extract obtained by inspissating the watery infusion, is moderately austere, bitterish, and subsaline. The spirituous extract is considerably stronger both in astringency and bitterness. Water at 212° extracts both its odour and taste; and the infusion strikes a black with sulphate of iron, and also forms a precipitate of a dark colour, with sulphate of zinc.

Chemical Analysis.—The petals of the Rosa Gallica contain, according to the analysis of Mr. Cartier, Tannin, Gallic acid, colouring matter, essential oil; fixed oil, or fatty matter; albumen, soluble salts of potash, insoluble salts of lime, silica, and oxide of iron. The relative proportions of these proximate principles have not been accurately ascertained; although their presence has been satisfactorily established.

Medical Properties.—It is generally believed that the petals of this rose are astringent; but Poterius, as cited by Lewis, states that he found a drachm of powdered red roses occasion three or four alvine evacuations, and this not in a few, but several instances. Ainslie also says, "the powder of the red-rose petals, in doses of one drachm, is purgative." Whether, however, they are purgative, or not, is of very little importance, since they are principally used as an elegant colouring matter in the infusion, which owing to the addition of sulphuric acid, is certainly astringent. This infusion forms an elegant and useful vehicle for neutral salts in hæmorrhages, and other diseases.

Off. Prep.—Confectio Rosæ, *L. E. D.*
Infusum Rosæ. *L. E. D.*
Mel Rosæ. *L. D.*
Syrupus Rosæ. *E.*

ROSA CENTIFOLIA.—*Hundred-leaved Rose.*

SPEC. CHAR. *Prickles* unequal, large, falcated. *Leaflets* edged with minute glands. *Flowers* drooping. *Calyx* viscid. *Fruit* oblong.

Syn.—Rosa Hollandica, sive batava, *Ger. Em.* 1262.
Rosa provincialis *Mill. Dict. n.* 18; *Willd. Sp.* 2. 1070.
Rosa centifolia, *Lin. Sp. Pl.* 704; *Redoubté Ros.* 1. 25. *t.* 1—37. *t.* 7—77, t. 26.—79. *t.* 27—111. *t.* 40.

FOREIGN.—*Rose à cent feuilles*, Fr.; *Die Centrifolienrose*, Ger.; *Hoa houng tau* Cochinch.

THIS, like the Rosa *gallica*, is generally regarded as a native of the south of Europe; but Lindley is disposed to consider Asia its native country, because it has been found wild by Bieberstein, with double flowers, on the eastern side of Mount Caucasus, whither it is not likely to have escaped from a garden. It is a much taller plant than the Rosa *gallica*, rising to the height of five or six feet, and beset with large, unequal-hooked prickles. The leaves resemble those of *gallica*, but are larger, and furnished on the margin with minute glands. From *gallica* it differs also by its flowers being cernuous, by the larger size of its prickles, and by its oblong or rounded, but never elongated fruit.

QUALITIES.—Many varieties of this species of rose are indiscriminately used for medicinal purposes. The petals are of a pale red colour, and of a very fragrant odour; and although this fragrance is very pleasant to most persons, several instances are on record where it was highly injurious. Both Echius and Schwenckius narrate cases of inflammation of the eyes, faintings, hysterical affections, abortion, &c. being produced; and Murray states, that persons confined in a close room, with a large quantity of roses, have been in danger of immediate extinction of life. From the experiments of Priestly and Ingenhousz, their effects are attributed to the mephitic air, (carbonic acid gas,) which these, in common with many other flowers, exhale. The petals impart their odour to watery liquids, both by infusion and

distillation. Six pounds of fresh flowers impregnate, by distillation, a gallon or more of water strongly with their flavour. On distilling large quantities of roses, a fragrant, butyraceous oil is obtained, which liquifies by heat, and appears yellow; but concretes in the cold into a white mass. The smell of this exactly resembles that of roses, and is well known as a perfume under the name of *Attar* or *Uttir*.

This valuable perfume is prepared in India, Persia, and Turkey, and is frequently adulterated with the oil of the sandal wood; the imposition, however, cannot be concealed, since the essential oil of sandal will not congeal in common cold; and its smell cannot be concealed, but will predominate in spite of every art. In Cashmere they seldom use sandal to adulterate the attar; but Colonel Polier states, that in order to increase the quantity, they are said to distil with the roses a sweet-scented grass, which does not communicate any unpleasant scent, and gives the attar a deep clear colour. This essence also does not congeal in a slight cold. The attar, or essential oil of roses, is also frequently adulterated with spermaceti, more particularly that imported from Turkey. The best mode of discovering this fraud, according to Mr. Milburn, is by the addition of a small portion of alcohol to the suspected oil; this will dissolve the genuine oil, and leave the spermaceti in lumps, which if heated will form one solid white mass. In the genuine oil, when congealed, the crystals will be short and uniform, not more numerous in one part than in another; for if they are of different lengths, the oil may be considered as adulterated. It is said that the colour of the attar is no criterion of its goodness, it being sometimes of a fine emerald green, of a bright yellow, and of a reddish hue, from the same country, and from the same process, only prepared from roses obtained on different days. The real oil or attar concretes with a slight cold; it floats on cold water, and dissolves slowly in highly rectified spirits of wine. It is seldom imported from India for sale; but considerable quantities are brought from Turkey. In speaking of the rose, Dr. Ainslie, in his valuable "Materia Indica," informs us that the attar of the Levant and Tunis is obtained from the Rosa *sempervirens*.

With the greatest caution, and all the auxiliary aid of science, very little *attar* can be obtained from English roses; and even in Italy they yield a very minute portion. Kœmpfer, in his *Amœnitates Exoticæ*, p. 374, speaks highly of the roses of Shiraz, where it would appear that a large quantity of this essential oil is prepared; nor are the roses and *attar* of Cashmere held in less estimation in the East. The roses of Barbary and Syria are inferior in quality to the Persian; and at Bassora, in the latter country, whole fields are cultivated for the purpose of making rose-water. In the Asiatic Researches, Colonel Polier gives the following process for making *attar*, or essential oil of roses;—"Forty pounds of roses, with their calyces, are put into a still with 60 lbs. of water. The mass being well mixed, a gentle fire is put under the still; and when the fumes begin to rise, the cap and pipe are properly fixed and luted. When the impregnated water begins to come over, the fire is lessened by gentle degrees, and the distillation continued until thirty pounds of water have come over, which is generally done in about four or five hours. The water is to be poured upon 40 lb. of fresh roses, and thence are to be drawn from 15 to 20 lb. of distilled water, by the same process as before. It is then poured into pans of earthenware, or of tinned metal, and left exposed to the fresh air for the night. The attar, or essence, will be found in the morning congealed and swimming on the top of the water. This is to be carefully separated and collected, either with a thin shell or a skimmer, and poured into a phial. When a certain quantity has been obtained, the water and feces must be separated from the clear essence, which, with respect to the first, will not be difficult to do, as the essence congeals with a slight cold, and the water may then be made to run off. If, after that, the essence is kept fluid by heat, the feces will subside, and may be separated; but if the operation has been neatly performed, there will be little or none. The feces are as highly perfumed as the essence, and must be kept, after as much of the essence has been skimmed from the rose-water as could be. The remaining water should be used for fresh distillations, instead of common water, at least as far as it will go."

The quantity of essential oil to be obtained from the roses is very variable, as it depends not only on the skill of the distiller, but also on the quantity of the flowers and the favourableness of the season. In order to obtain four *mashas* (about $1\frac{1}{2}$ drachm) from 80 lbs., which, deducting the calyces, amounts to something less than 3 drachms *per* 100 pounds of rose leaves; the season must be very favourable, and the operation carefully performed.

Rose Water (*Aqua Rosæ* Ph. Lond.) is prepared by taking *eight* pounds of the petals of Rosa *centifolia*, and pouring over them as much water as will prevent empyreuma during the distillation, and then distilling a gallon. This water has the agreeable odour of the rose in great perfection when properly prepared; but is very apt to spoil, unless it be rectified by a second distillation.

Medical Properties.—The petals of the hundred-leaved rose are considered to be slightly laxative; and the syrup is often mixed with a little almond oil, and given to children as a domestic medicine. Rose-water is an elegant medium for preparations of lead and zinc, of which collyria are generally composed.

Off. Prep.—Aqua Rosæ. *L. E. D.*

Syrupus Rosæ. *L. E.*

Pl. 100.



Rosa canina.

Weddell Pinxit

ROSA CANINA.

Common Dog Rose.

Spec. Char. *Fruit* ovate, smooth or somewhat bristly. *Calyx* pinnate, deciduous. *Prickles* strongly hooked. *Styles* distinct. *Leaflets* rigid, ovate, pointed, quite smooth.

Syn.—Rosa sylvestris inodora, seu canina, *Raii Syn.* 474; *Park.* 1017.
R. canina inodora, *Ger. Em.* 1270. *f.*
R. sylvestris vulgaris, flore odorato incarnato, *Bauh. Pin.* 483.
R. sylvestris alba cum rubore, folio glabro, *Bauh. Hist. v.* 2. 43. *f.*
R. n. 1101, *Hall. Hist. v.* 2. 38.
R. canina, *Lin. Sp. Pl.* 704; *Willd. v.* 2. 1077; *Fl. Brit.* 540; *Engl. Bot. v.* 14. *t.* 992; *Lind. Ros. p.* 98; *Hook Scot.* 157; *Wood's Trans. of Lin. Soc. v.* 12. 223. *Woodv. v.* 3. *t.* 139.

Provinicially.—*Wild Brier. Dog Rose. Hep-tree.*

Foreign.—*Le Rosier sauvage; Rose de Chien,* Fr.; *Rosa silvatica,* It.; *Rosa silvestre; R. peruna,* Sp.; *Rosa brava,* Port.; *Hundrose,* Ger.; *Niupon,* Swed.; *Schiopwnik,* Rus.

The Dog Rose, the most common ornament of our hedge-rows, and universally admired for the beauty of its foliage, its large, handsome, fragrant flowers, and its rich coral fruit, is sufficiently familiar to every one. It is not, however, generally known that this species is very apt to be confounded with some others, equally common, which it nearly resembles; we shall therefore make no apology for quoting Lindley's description:—"A straggling briar six or seven feet high. The branches light green, reddish-brown on the sunny side; armed with strong, scattered, hooked, nearly equal, prickles (rarely straight, and then much closer together.) Leaves distant, pale or dark green, frequently tinged with red, in exposed situations usually much blistered by the sun, quite free from pubescence; stipules rather dilated, a little reflexed, acute-pointed; petiole armed with a few little hooked prickles; leaflets 5—7, ovate or oblong, acute or rounded, sessile or subsessile, flat or concave, even or rugose, coarsely or

finely, simply or doubly, serrated; the serratures always acute, without glands and converging. Cymes one or many-flowered; bracteæ ovate-lanceolate, appressed, acute, concave or flattish, finely toothed and glandular at the edge; peduncles and calyx smooth; tube ovate; sepals spreading, sharp-pointed, deciduous, somewhat divided; petals obcordate, concave; disk very thick, elevated; ovaries 20—30; styles nearly smooth, distinct, included or a little exserted. Fruit ovate or oblong, scarlet, shining, without any bloom; pericarps large, uneven." It flowers in June and July, ripening its fruit late in autumn. Fig (*a*) represents the fruit cut open to show the seeds; (*b*) a seed.

The foregoing description applies strictly to R. *canina*. "When this is weak, and grows in woods or shady places among grass, it has straight prickles, and becomes R. *nuda* of Woods: with very distinct aculei, it is R. *andegavensis* of Bastard; with very dense ones it is R *canina* of Rau."

Qualities.—The fruit has no odour, but a pleasant, sweet, acidulous taste, which is said to depend on uncombined citric acid and sugar.

Medical Properties and Uses.—The pulpy part of the heps of the dog-rose is slightly astringent, but possesses no very remarkable medical properties; beat up with sugar, it forms a confection, which sometimes enters into the composition of demulcent electuaries, and was formerly much esteemed in the treatment of dysentery. It is also employed to form calomel, antimony, &c. into pills; and is sometimes served up at table as a dessert, and the Germans make a very agreeable sauce of it, something resembling that of the Tomato. The root has been recommended in hydrophobia, whence indeed its specific name *canina*. The Tartars boil the twigs and leaves in the place of tea, and the Siberians praise them for their reviving, stomachic qualities. The inhabitants of the Volga prepare a spirit from the flowers, by fermentation; and in the Ukraine they are made into a preserve with honey and sugar.

A reddish, moss-like, prickly excrescence, called *Bedeguar*, *Rose sponge*, and by the French *Galle chevelüe*, is frequently found upon the branches of the Rosa *canina*, and other roses. This excrescence is the habitation of the larva of a small hymenopterous insect, Cynips *Rosæ*, and was formerly celebrated for its astringent powers.

Off. Prep.—Confectio Rosæ caninæ, L. *olim*, Conserva Cynosbati.



Crocus sativus.

CROCUS SATIVUS.

Saffron Crocus.

Class III. TRIANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. ENSATÆ, *Lin.* IRIDES, *Juss.*
IRIDEÆ, *De Cand.* IRIDACEÆ, *Burn.*

GEN. CHAR. *Perianth petaloid,* in six deep equal segments; tube longer than the limb. *Stigmas* convoluted.

SPEC. CHAR, *Leaves* setaceous. *Stigma* reflexed laterally, in three deep, linear, notched segments.

Syn.—Crocus, *Raii Syn.* 374; *Ger. Em.* 151. *f. Fuch. Hist.* 441. *f.*; *Plin.* xxi. 6.
Crocum, *Matth. Valgr. v.* 1. 62. 63. *f.*; *Camer. Epit.* 33. *f.*
Crocus autumnalis, *Eng. Bot. v.* 5. *t.* 343.
Crocus setifolius, *Stokes, Bot. Mat. Med. v.* 1. *p.* 104.
Crocus officinalis, *Huds. Fl. Angl.* 13, *a*; *Mart. Rust. v.* 2. *t.* 35.
Κροκος et Κρόκον, *Hom. Iliad,* Ξ, 348 : *Theophr.* vi. 6; *Diosc.* i. 25.
Crocus sativus, *Lin. Sp. Pl.* 54, *a. Willd. v.* 1. 194; *Fl. Brit.* 39; *Redouté Liliac. v.* 3. *t.* 173; *Woodv. t.* 176.

FOREIGN.—*Saffran,* Fr.; *Safferano,* It.; *Azafran,* Sp.; *Acafrao,* Port.; *Safranplanze,* Ger.; *Schafran,* Rus.

OUR drawing of this beautiful and interesting Crocus, which affords the well-known Saffron of the shops, was taken from specimens obligingly communicated to us by Mr. Fiske of Walden in Essex, where it was formerly much cultivated for medical use. It is a perennial, bulbous plant, and is supposed to have been originally brought from the East, where it first acquired that high reputation in medicine, which it has now almost lost in Europe. It is said that the saffron crocus was imported into England in the reign of Edward III., and that a Sir Thomas Smith introduced it into the neighbourhood of Walden, where it was probably first cultivated. It was, however, grown at an early period in Herefordshire; but it is now confined to a very small district in Cambridgeshire, at the foot of the Gogmagog hills. It appears to have been planted abundantly near Walden, at the end of the sixteenth and at the beginning of the seventeenth century. It

migrated gradually into Cambridgeshire between the year 1675 and 1723, where the place of its growth was the large tract of ground between Saffron Walden and Cambridge, in a circuit of about ten miles. At present, however, it is, we believe, but little attended to by the farmer, and is now confined to two or three parishes only, of which Stapleford is one. Saffron has long been extensively cultivated in many countries on the continent, particularly in France and Spain; but English Saffron is generally preferred here to that which is imported, and may be distinguished by its parts being larger and broader. The bulbs may be planted in dry, light soil; but they succeed best in sand. About the first week in October the flowers begin to appear; but the seeds are never perfected in this climate.

The saffron crocus has a roundish bulbous root, as large as a small nutmeg, which is solid, somewhat compressed, and covered with a coarse brown reticulated skin. From the bottom of this bulb are sent out many long slender fibres, which strike pretty deep into the ground, and are, properly speaking, the true roots. Immediately from the upper part of the bulb proceed the flowers on a long slender white tube, which together with the leaves are inclosed in a thin membranous sheath, opening on one side. The leaves are numerous, curved, linear, smooth, longer than the corolla, of a deep green colour, with a white central stripe, and are accompanied by the flowers. The corolla is large, and divided into six nearly elliptical segments, equal, and of a rich violet, or lilac colour. The stamens are shorter than the corolla, and surmounted by arrow-shaped, erect, pale yellow anthers. At the bottom of the tube is situated a roundish germen, crowned with the style, which is thread-shaped, the length of the corolla, and hangs out at one side between the segments. The stigma is deeply 3-parted, of a deep orange colour, fragrant, narrow, a little dilated upwards, and notched at the summit.—Fig. (*a*) represents one of the segments of the corolla with a stamen and anther; (*b*) the 3-parted stigma, which is the officinal saffron.

Distinctive Characters.—Saffron differs from the spring crocus (C. *vernus*) in having the stigma divided into three very long narrow segments, which are notched at the summit, of a

deep orange colour, and fragrant. In the spring crocus the stigma is within the flower, divided into three wedge-shaped jagged lobes, which are inodorous, and the tube of the corolla is hairy at the mouth: while in the officinal species the throat of the corolla is smooth. The naked-flowering crocus (C. *nudiflorus*) is readily distinguished from the other two by the deeply-laciniated tufted segments of the stigma, and by the flowers, which are of a deep purple, appearing in autumn unaccompanied by leaves; the latter not being produced till December.

Saffron is unquestionably a native of Greece and Asia Minor, having been introduced into the south of Europe for cultivation as a medicinal plant; but it has naturalized itself in some parts of England, and is retained by Smith in the English Flora, on the authority of the Rev. Mr. Wood, who found it about Halifax, and of Mr. Whatly, who observed it near Derby. Of the genus, Miller admits only two species, the autumnal saffron, C. *sativus* and the spring crocus, C. *vernus*. Sir J. E. Smith describes three species as natives of Britain, C. *vernus*, *nudiflorus*, and *sativus*: of the former there are several varieties, blue and purple, yellow, white, and striped. Linneus reduces all the species to one, and supposes the vernal, and the autumnal, or officinal crocus, to be only varieties, notwithstanding the difference in the form of their stigmas, leaves, and bulbs, as well as in the time of their flowering. Besides these, the following species are cultivated in crocus beds;—C. *versicolor*, or party-coloured crocus, a kind which requires a light loam, while most of the others grow best in sand; C. *biflorus*, or yellow-bottomed; C. *mœsiacus*, or great yellow; C. *susianus*, or cloth of gold; C. *sulphureus*, or sulphur-coloured; and C. *serotinus*, or late-flowered, blossoming in autumn, the leaves appearing at the same time with the flower. The Scotch crocus is said by Mr. Neill to be a beautiful striped variety.

The medicinal properties of this flower were early known to the Romans; as we find that the Cilician physicians who attended Anthony and Cleopatra in Egypt, recommended saffron as a medicine that cleared the complexion, by relieving the jaundice or the bile: which is an early indication of the prevalence of the "doctrine of signatures," for which the sect termed "*Rosicru-*

sians," or "*Theosophists*" became so notorious in the beginning of the 14th century. Dioscorides says that it is good for a surfeit. Pliny informs us that the best saffron grew in Cilicia, on a mountain called Corycus, and that the next in quality on Mount Olympus. The Sicilian saffron was also esteemed by the Romans, who used it as a perfume. According to Pliny, it was steeped in wine, and then sprinkled over the theatres, filling every part with a sweet odour. The same author says, the wild crocus produces the best saffron, therefore the planting of it in gardens was deemed bad husbandry, for the plants became strong and large; while the flowers yielded but few chives, and would not pay the expense of planting. In a work, comparatively modern, (Townsend's Travels in Spain,) the plant is mentioned as growing in abundance in the neighbourhood of Salamanca, where, without cultivation, it affords excellent saffron. Saffron is the κροκος of the Greeks; and is mentioned by Homer as one of the flowers that formed the genial couch of Jove and Juno:—

Ἦ ῥα, καὶ ἀγκὰς ἔμαρπτε Κρόνου παῖς ἣν παράκοιτιν·
Τοῖσι δ' ὑπὸ Χθὼν δῖα φύεν νεοθηλέα ποίην,
Λωτόν θ' ἑρσήεντα, ἰδὲ κρόκον, ἠδ' ὑάκινθον
Πυκνὸν καὶ μαλακόν· ὃς ἀπὸ χθονὸς ὑψόσ' ἔεργε·
Τῷ ἔνι λεξάσθεν, ἐπὶ δὲ νεφέλην ἔσσαντο
Καλὴν, χρυσείην· στιλπναὶ δ' ἀπέπιπτον ἔερσαι.

Iliad, Lib. xiv. 346.

from whence it has been inferred, that exhilarating properties were ascribed to it even in his days. Lindestolpe suspects that it was the νεπενθες, nepenthes, of Homer; while other writers have affixed this appellation to the Inula *Helenium* and Borago, but without consideration, for in the celebrated passage alluded to, the word is evidently not used as the name of any especial plant, but merely to express the quality of the soothing oblivious draught proffered to Telemachus by Helen.

Our plant is the *zaffaran*, or *zahafaran* of the Arabians, and was highly esteemed by the Hebrews, who called it *carcom*. It is the Crocus of the Latins, who named it after a beautiful youth, who was said to have been consumed by the impatience of his love for Smilax, but was, by Hercules his father, changed into this flower, while Smilax was metamorphosed into the plant

called by his name, Smilax, or Bindweed. Ovid commemorates this fable, and Virgil also speaks of the crocus as one of the flowers upon which the bees most love to feed :—

——— "pascuntur et arbuta passim,
Et glaucas salices, casiamque, crocumque rubentem,
Et pinguem tiliam, et ferrugineos hyacinthos."—GEORG. 4.

By the old Chemists saffron was called, from its golden colour, *Aurum Philosophorum ;* by others, *Sanguis Herculis*, *Aurum Vegetabile*, *Rex Vegetabilium*, and *Panacea Vegetabilis.* Its English name is evidently derived from its Arabian ; which is nearly the same in French, Dutch, and German.

CULTURE.—As several naturalists with whom we conversed were ignorant of the habits of this plant, and as it is imperfectly described in a work, which passes for an authority, we took the pains to obtain specimens from Samuel Fiske, Esq. of Saffron Walden, a gentleman who once cultivated it, and who is an accomplished botanist. In his communication, for which we are greatly indebted, he says, "The bulbs of the Crocus *sativus* are planted in July, in a rich light mould, with some well-rotted manure, in rows six inches apart, and three inches distant from each other in the rows.

"About the 18th of September, the leaves, [or grass], begin to appear in small pencil-like tufts, and during, and after the period of flowering, keep growing, and gradually cover the whole bed, continuing green all the winter, until May, when they die away, and the bed is bare all the next summer.

"The flowers begin to spring up about the 3rd of October, with a stem about an inch above the ground ; they continue daily coming up for three or four weeks, six, eight, or more rising in succession from one plant. They are gathered every morning during the time of flowering, and the stigmata or chives, with part of the style plucked out for use, the rest of the flower being thrown away.

"The saffron, thus procured, is either dried in a room, in the sun, on papers, or made into cakes by a moderate heat and pressure.

"At the end of three years, when the leaf is entirely dead, the

bulbs are taken up and cleaned, and the largest set by for planting again.

"The increase in the bulbs is very great, but being of no use except for replanting, what are not wanted for that purpose are thrown away; and as the produce of the saffron does not repay the expenses, it is now entirely out of cultivation here as an article of commerce."

Qualities and Chemical Properties.—Saffron has a powerful, penetrating, diffusive odour, and a warm, pungent, bitterish taste. It gives out the whole of its virtues and colour to rectified spirit, proof spirit, wine, vinegar, and water, and in a smaller degree to ether; about three parts in four of the saffron being taken up by each of these menstrua, and the matter which remains undissolved is inodorous, insipid, and of a pale clay colour. The acetous, and even vinous tinctures of saffron, on long keeping, lose a little of their colour and strength; but those made with rectified spirit remain good for years. In distillation it impregnates water strongly with its flavour. If the quantity of saffron be large, a small portion of a fragrant and very pungent oil may be collected, amounting, as Vogel says, to about $1\frac{1}{2}$ drachm from 16 ounces. Rectified spirit also elevates a considerable share of its flavour, but much the greater part is concentrated in the extract. The watery infusion, which has the deep orange-red colour of the saffron, is rendered of a very deep purple by strong sulphuric acid, the mixture emitting the smell of vinegar, and yielding a copious black precipitate when diluted by water. Hence it may be inferred that saffron contains chiefly extractive, which, according to Hernbstaedt, is nearly pure, and in proportion of 10 parts in 16 of the vegetable, the remainder being mostly ligneous fibre. It contains also a small portion of resin.

According to an analysis by MM. Vogel and Bouillon Lagrange (Ann. de Chim. xxx. 188,) Saffron is composed of a substance termed,

*Polychroite,** 65 .

Odorous Volatile Oil,

* The colouring matter is not pure *polychroite*, but about three-fourths of the proportion stated above may be considered to be so, with an admixture of one-fourth of extractive matter.

Wax	0 . 50
Gum	6 . 50
Albumen	0 . 50
Salts of lime, potass, and magnesia	10
Water	10
Vegetable *debris* . . .	10

Polychroite is in the form of powder, of an intensely yellow colour. It attracts moisture from the atmosphere; is very soluble in water and alcohol; somewhat soluble in sulphuric ether; insoluble in the oils. It is combined with a fixed oil, which may be separated by the action of alkalies. It has a bitter, pungent taste, and a strong, fragrant odour. It is obtained from the stigmas of the crocus, by evaporating a watery infusion to the consistence of honey, which is digested in alcohol; filter the solution and evaporate to dryness. The dried mass is the Polychroite.

Adulterations.—Even in the time of Pliny, saffron was adulterated: and the best way of trying it, he says, is to lay the hand on it, when, if good, it will be heard to crack or snap: from which we presume the saffron was a dry sort. He further states, that after handling it, if the hand be put into the mouth, it will cause a stinging sensation in the face and eyes if it be good; and on being chewed, stains the spittle and teeth. It is still often adulterated with the petals of Carthamus *tinctorius* and Calendula *officinalis;* by expanding the suspected article in hot water, the *petals* of the fraudulent additions will be readily found.

Medical Properties and Uses.—"The writers on materia medica," says Dr. Cullen, "have constantly spoken of it as a very active medicine; but their reports of its effects are in some instances manifestly extravagant, though repeated by Boerhaave himself; and very frequent experiments in practice do not at all support the opinions that have been commonly entertained of it. I have given it in large doses, without its showing any sensible effects; hardly in any degree increasing the frequency of the pulse; and as an anodyne or antispasmodic, I have hardly observed its operation."

Schroder asserts, that if taken to the quantity of two or three drachms it proves fatal; and by several authors we are informed, that in large doses it produces cephalalgia, intoxication, and mania. It is also said to be plentifully absorbed and to tinge the various textures of the body. From direct experiments, however, made by Dr. Alexander, saffron evidently possesses but little active power over the great majority of mankind, when given even in very large doses; and Dr. H. Cullen administered it in the quantity of half an ounce a day, in several hysterical cases, without any sensible effect. It has often been said to produce great hilarity, which report is, however, contradicted by Bergius, whose words are, "Nobilis matrona semper in tristitiam illapsa est ingentem, postquam pulveres crocatos ei proprinaveram."

Saffron is now discarded from practice as a medical agent; but still enters into the composition of several officinal preparations, to impart an aromatic flavour and a rich colour.*

Off. Prep.—Confectio aromatica. L. D.
Decoctum Aloes comp. L.
Pilula Aloes c. myrrhâ. L.
Syrupus Croci. L.
Tinctura Aloes comp. L.
——— Aloes. D.
——— Cinnamomæ comp. L.
——— Croci sativi. E.
——— Rhæi. L.
——— Rhæi comp. L.

* American Soothing Syrup.—This vile nostrum, which is puffed off in the newspapers "as a real blessing to mothers," is nothing more than syrup of saffron, with a portion of nitrate of potass or saltpetre, and laudanum!

Pl 102



Myroxylon peruiferum.

Weddell Beat.

MYROXYLON PERUIFERUM.

Sweet-smelling Balsam-tree of Peru.

Class X. DECANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. LOMENTACEÆ, *Lin.* LEGUMINOSÆ, *Juss. De Cand.* CICERINÆ LOTACEÆ SOPHORIDÆ, *Burn.*

GEN. CHAR. *Calyx* bell-shaped, 5-toothed. *Petals* five, the upper one larger than the others. *Germen* stalked, longer than the corolla. *Legume* with one seed only, at the point.

SPEC. CHAR. *Leaflets* pointed, emarginate. *Claw* of the larger petal twice the length of the calyx.

Syn.—Hoitziloxitl, *Hernandez Nova Plant. &c. Mexican Hist.* fol. 61. *f.*
Cabureiba, *Piso. Bras.* 57. 119.
Toluifera Balsamum, *Lin. Sp. Pl.* 549; *Woodv. v.* 3. *t.* 193.
Myroxylon peruiferum, *Willd. Sp. Pl. v.* 2. 546; *Stokes, v.* 2. *p.* 471; *Lambert Illustr. of the Genus Cinchona, p.* 92.

FOREIGN NAMES OF THE BALSAM.—*Baume de Pérou*, Fr.; *Balsamo del Peru*, It.; *Balsamode Quinquica*, Sp.; *Peruvianischer Balsam*, Ger.

THE Sweet-smelling Balsam-tree, which yields the precious balsam of Peru, is a native of the warmest provinces of Mexico and Peru. It grows in the mountains of Panatahuas, in the forests of Puzuzu, Muna, Cuchero, Paxaten, Pamphaermosa, and in many other countries near the river Maranon, in low, warm, and sunny situations, blossoming in August, September, and October. The natives of the country call the tree by the name of *Quinquino*, and its bark and fruit by that of *Quinquina*. Hernandez says that the Mexican kings cultivated it in their gardens, and that if the trunk or bark be wounded, at any time of the year, but especially at the end of the rainy season, the celebrated and valuable balsam of Peru distils from the wound; "this is of a dark or blackish-orange colour, of an acrid and

somewhat bitter taste, a most powerful but highly agreeable smell." It was discovered by the celebrated Don Jose Cælestino Mutis, of Santa Fe de Bogota, New Granada, who sent specimens of the leaf, flowers, and fruit, to the younger Linneus about the year 1781. The plate which illustrates the following description is taken by permission from Mr. Lambert's valuable work "on the Genus Cinchona," and was made from very fine specimens received from the distinguished author of the "Flora Peruviana et Chilensis," Don Jose Pavon.

It is described by Don Hippolito Ruiz, as a branching and elegant tree, growing to the height of thirty *varas* and upwards. The trunk is thick, straight, smooth, and covered like the branches with a grey, coarse, compact, heavy bark, granulated, of a pale straw colour interiorly, and filled with a fragrant resin, which abounds in every part of the tree. The branches extend almost horizontally. The leaves are alternate, and composed of two, three, four, and sometimes five pairs of leaflets, nearly opposite, and ovate-lanceolate acute, but with the apex somewhat obtuse and emarginate, smooth, shining, entire, marked with translucent linear points, like those of the orange-tree, hairy on the under surface, and standing on short footstalks. Many leaves terminate unequally, and in this case consist of five, six, or nine leaflets. The flowers spring from the scars of the young branches, and from the axillæ of the leaves in long downy erect racemes, longer than the leaves, on slender stalks, scarcely an inch long, with a small, concave, ovate bractea at the base of each. The calyx is bell-shaped, dark green, divided into five small, nearly equal teeth, but with one of them so far separated from the rest as to be found under the germen. The corolla is composed of five white petals, four of these narrow, equal, lanceolate, and larger than the calyx; the fifth reflexed, broad, and double the size of the others. The filaments are ten, inclining and inserted into the calyx; bearing elongated, sharp-pointed, sulcated anthers. The germen is oblong, pedicellated, inclining with the stamens to the same side; the style short, awl-shaped and crooked, with a simple stigma. The pericarp or seed-vessel is pendulous, straw-coloured, nearly six inches in length, club-shaped, somewhat

curved,globular near the top, and terminated by the curved style. It contains in a cell in the globular part, a single seed, which is crescent-shaped, projecting from the cell, and between this and the lining of the pericarp there is a hollow space filled with a yellow liquid balsam, which in time dries and becomes as hard as resin.—Fig. (*a*) represents a flower magnified; (*b*) the curved germen surrounded by the bell-shaped calyx; (*c*) the one-celled pericarp, showing the projecting seed; (*d*) the crescent-shaped seed.

"The balsam of Quinquino," continues Ruiz, "is procured by incision at the beginning of the spring, when the showers are gentle, frequent, and short; it is collected in bottles, when it keeps liquid for some years, in which state it is called, '*white* liquid balsam.' But when the Indians deposit this liquid in mats or calabashes, which is commonly done in Carthagena, and in the mountains of Tolu, after some time it condenses and hardens into resin, and is then denominated, '*dry white balsam, or balsam of Tolu*,' by which name it is known in the druggists' shops.

"It is generally believed, and M. Valmont de Bomare says, in his Dictionary of Natural History, that if an extract be made from the bark, by boiling it in water, it remains liquid and of a blackish colour, known under the name of '*Black Peruvian Balsam*.'

"The Indians of Puzuzu, and of some other parts of South America, do not collect the balsam of this tree: whether it is, that they are ignorant of the method of obtaining it, and of its value, or because few trees are found in the neighbourhood of their towns, the only parts which they collect are the barks most filled with resin condensed into drops and lumps, and the fruit, in order to sell them in the neighbouring provinces, both of which are used for the purpose of perfuming clothes and apartments.

"The fruit, as well as the bark, being reduced to a coarse powder, they mix with it oil of Maria, Carana, Jacamaca, Lera, or Sebo, and make with it little plasters, which they apply upon the tempels and behind the ears, to mitigate the pains of the head-ache and the tooth-ache, particularly hemicrania."

Qualities and Chemical Ppoperties.—The Balsam of Peru* has the consistence of honey, a brown colour, an

* A "*balsam*" is a substance possessing the general properties of a resin; but, which when heated, or digested in acids, yields benzoic acid.

agreeable smell, and a hot acrid taste. When boiled with water for some time, the liquid separated by the filter reddens vegetable blues, and deposits crystals of benzoic acid in cooling. The water contains no other substance.* When distilled with water, it yields a very small quantity of reddish limpid oil; and benzoic acid sublimes in the neck of the retort. At 550° the balsam begins to boil, when exposed to heat in a water bath, and some gas is discharged. At 594° the oil, mixed with a little water, comes over pretty fast. At 617° it rises still more rapidly. Lichtenberg, to whom we owe these experiments, kept four ounces of balsam at that temperature for two hours, and obtained two ounces of a yellowish oil, and a crystallized mass of benzoic acid, which, together with the water, weighed $6\frac{1}{2}$ drachms. The gas obtained amounted to 58 ounce measures; 38 being carbonic acid. The rest burn like olefiant gas.

Saturated solutions of the alkalies and their carbonates form a thick mass when mixed with the balsam; and a solution, when saturated with sulphuric acid, deposits crystals of benzoic acid. Treated with nitric and muriatic acids, the presence of prussic acid is indicated, benzoic acid sublimes, and Mr. Hatchett found that the residue possessed the properties of artificial tannin. When this balsam is treated with sulphuric acid, artificial tannin is also formed, and the residual charcoal amounts to no less than 0.64 of the original weight of the balsam.†

Tolu Balsam was formerly supposed to be the produce of another tree called *Myroxylon Toluifera*, but although these plants are specifically distinct and yield their respective balsams, it is said that either or both kinds of balsam can be procured, according to the processes followed, from either tree. Tolu Balsam is a soft solid, and comes to England in gourd shells. It is of a reddish brown colour, and considerable consistence; and when exposed to the air, becomes solid and brittle Its smell is fragrant, and continues so even after the balsam has become thick by age. When distilled with water it yields very little volatile oil, but impregnates the water strongly with its taste

* Lichtenberg, Gehlen's Jour. vj. 489.

† Hatchett's Third Series of Experiments on Artificial Tannin, Phil. Trans. 1806.

and smell. A quantity of benzoic acid sublimes, if the distillation be continued.* Like the rest of the balsams, it is soluble in the alkalies. When digested in sulphuric acid, a considerable quantity of pure benzoic acid sublimes; and when the solution is evaporated to dryness, and the residue treated with alcohol, artificial tannin is obtained. When dissolved in nitric acid, it presents nearly the same phenomena as the resins; but assumes the odour of prussic acid. During the solution in nitric acid, a portion of benzoic acid sublimes. By repeated digestions it is converted into artificial tannin.

Medical Properties and Uses.—*Peruvian balsam* resembles the balsam of Copaiba in its medical virtues; it is however more heating, and does not relax the bowels in its usual doses. It has been employed as an expectorant in catarrh and dyspnœa, when attended by an increased secretion of mucus; and from its stimulating the stomach, or from a similar action on the exhalents or absorbents of the lungs, it has been found serviceable. In consequence of its stimulating and tonic powers, it has been prescribed as a remedy in paralysis, chronic rheumatism, and leucorrhœa; and in combination with calomel, it has been efficaciously administered for the tremors which arise from the noxious influence of lead. At one period it was held high in repute as a detergent application to wounds and ulcers. Kirkland and Rowley attest its efficacy in high terms of commendation: and in those irritable ulcers of the leg, which have a glassy surface, and are devoid of granulations, it was much employed by the late Mr. Whately; and in our own practice, we place great reliance on it. It has also been much employed as a local application to gangrenous affections, and a case is recorded by Mr. Smith in the "Lancet," of a chancre, attended with phymosis and extensive ulcerations of the prepuce, readily yielding to its power. The mode of applying it is by drenching a piece of lint in it, which is to be laid on the diseased part, night and morning, till healthy granulations appear.

Dose.—From thirty drops to a drachm, repeated at proper intervals.

* Lewis, Neumann's Chem. p. 285.

Mistura Balsami Peruviani.

℞ Balsami Peruviani ʒij
Mellis depurati ℥i
Misturæ Amygdalæ ℥viss

Fiat Mistura, cujus sumat cochlearia tria magna sexta quaque hora.

Balsamum Peruvianum cum Felle Bovino.

℞ Fellis Bovini ʒiij
Balsami Peruviani ʒi Misce.

Dr. Hugh Smith recommended this application to be occasionally dropped into the ear, when there is a fetid discharge from it; but these articles do not readily combine.

Unguentum Balsami Peruviani.

℞ Balsami Peruviani ʒi
Unguent. Cetacei ʒvij Misce.

This is a useful application for ulcers requiring a gentle stimulus; and is a favourite and efficacious remedy for cracked nipples.

Tolu Balsam.—This balsam is stimulating and expectorant, and is the mildest of all the balsams. Its tincture and syrup are occasionally added to mucilaginous mixtures when prescribed for chronic coughs; but Tolu balsam is little valued, excepting for its pleasant flavour. In gleets it is sometimes useful, and has been applied to wounds and ulcers, when a slight stimulus seemed to be required.

Off. Prep.—Syrupus Tolutani. L.
Tinctura Benzoini comp. L. E. D.
——— Toluiferæ Balsami. E. D.

Other species of *Myroxylon*, as M. Pubescens, yield a balsam very similar to the balsam of Peru, if not identical with it: indeed, Humboldt and Bonpland consider M. Peruiferum and M. pubescens to be but varieties of one species, and Jacquin was of the same opinion. He named the whole group *Myrospermum*.



Pl 103.



Polygala Senega.

W. Hill sc.

POLYGALA SENEGA.

Rattle-snake Milkwort.

Class XVII. DIADELPHIA.—*Order* III. OCTANDRIA.

Nat. Ord. LOMENTACEÆ, *Lin.* PEDICULARES, *Juss.* POLYGALEÆ, *De Cand.* POLYGALACEÆ, *Burn.*

GEN. CHAR. *Calyx* 5-leaved, with two of the leaflets wing-like and coloured. *Standard* of the *corolla* cylindrical. *Capsule* obcordate, 2-valved, and 2-celled.

SPEC. CHAR. *Leaves* alternate, lanceolate. *Flowers* alternate, beardless. *Spike* terminal, slender, solitary, tapering. *Stem* erect, simple, herbaceous, leafy.

Syn.—Planta Marilandica, (Polygala ?) caule non ramoso, spico in fastigia singulari e flosculis albis composita, *Raii Syn.* 640.

Polygala caule simplici erecto, &c. *Gron. Flor. Virg. ed.* 1. *p.* 80.

Polygala floribus imberbibus spicatis, &c. *Gron. Virg.* 103.

Polygala Senega, *Lin. Sp. Pl.* 990; *Willd. v.* 3. 894; *Amæn. Acad.* 2. *p.* 139. *t.* 2; *Michaux Flor. Amer. Bor.* 2. *p.* 53; *Woodv. v.* 2. *t.* 93; *Stokes, v.* 3. 504; *Bot. Mag. v.* 26. *t.* 1051; *Barton Mat. Med. U. S. v.* 2. *p.* 111. *t.* 36; *Bigelow, Amer. Med. Bot. t.* 30.

ENGLISH.—*Seneka Snake Root; Rattlesnake-root; Officinal Milkwort, or Snake-root; Seneka.*

FOREIGN.—*Polygalie de Virginie*; *Senega*; *Racine de serpent à sonnettes*, Fr.; *Poligala Virginiana*, It.; *Senegawurz*; *Klapperschlangenwurz*, Ger.

THE Polygala *Senega* is a hardy perennial, a native of North America, growing in most latitudes in the United States, on the sides of hills and in dry woods. It is abundant in Kentucky, Ohio, and Tennessee; flowering from June to August. It was first cultivated in England by Philip Miller in 1759; but having little beauty to boast, it is rarely met with in our gardens. There is a variety with whitish flowers in a dense spike or cluster, and another with rose-coloured flowers in a lax spike and narrower

leaves. The rose-coloured variety, as it has been considered by Michaux and Pursh, is said to be a distinct species. Some varieties, which Professor Bigelow possesses from Carolina, have branching, pubescent stems, and very long loose spikes. Of this genus M. De Candolle enumerates above one hundred and sixty species, growing in every quarter of the globe; but one only, Polygala *vulgaris*, or common Milkwort, is British.

The root of Polygala *Senega* is woody, branched, contorted, about half an inch in diameter, and covered with a thick dull yellowish or greyish bark; it sends up several annual stems, about a foot in height, erect, slender, round, simple, smooth, of a dull purple colour below, and greenish towards the top. The leaves are alternate, scattered, lanceolate, pointed, smooth, somewhat undulated, occasionally tinged with red, and nearly or quite sessile: towards the base they are smaller and nearly ovate. The flowers are in loose, terminal spikes, apparently papilionaceous, generally white, often tinged with purple, and sometimes pale yellow. The calyx, which in this genus is the most conspicuous part of the flower, consists of five leaflets; the two largest of which are roundish-ovate, white, and slight veined. The corolla is small, closed, having two obtuse lateral segments, and a short crested extremity. The stamens are all united at the bottom, and attached to the corolla; with eight tubular anthers opening at the summit. The fruit is an obcordate, compressed, 2-celled, 2-valved capsule, containing two oblong-obovate, slightly hairy, curved, blackish seeds. The spike opens very gradually, so that the lower flowers are in fruit, while the upper ones are in blossom.—Fig. (*a*) represents the three smaller leaves of the calyx; (*b*) the different parts of the corolla, &c.; (*c*) the capsule and seeds; (*d*) the root.

The generic name is compounded of two Greek words, πολυς, *much*, and γαλα, *milk*, in allusion to its reputation of increasing the secretion of milk in those animals that partake of it. But at this time, the species which gave origin to the idea is not known.

Qualities and Chemical Properties.—The root of the Polygala *Senega* has little or no smell; but to the taste it is bitter,

pungent, subtle, and peculiar. After chewing, it leaves a sensation of acrimony in the mouth, and still more so in the fauces, if it have been swallowed. Both aqueous and spirituous menstrua extract its virtue; but the alcoholic most completely. The powder in substance is, however, more active than either the tincture or decoction. The bark of the root contains the most active principles of the plant: the ligneous portion being comparatively inert. Alcohol dissolves a substance apparently of the resinous kind, giving a precipitate when water is added Iron produces little change in solution of this root, and gelatin occasions no alteration whatever.

A peculiar vegetable principle has recently been discovered by Gehlen, in the root of the Polygala *Senega*, to which he has given the name of *senegin*. It is obtained by treating the alcoholic extract with water and ether; the latter abstracting a portion of resin, and the former dissolving a little mucilaginous and saccharine matter. It is a solid substance of a brown colour, and excites violent sneezing like tobacco. It has a disagreeable taste, is soluble in alcohol, but insoluble in water and ether.

M. Reschier is also said to have isolated from six ounces of the root of Senega, a hundred grains of a peculiar alkaline principle, '*Polygaline*;' which is united to an acid termed, '*Polygalinique*.' It is regarded as a substance *sui generis*, and as containing the active principle of the plant; but we know not whether it be identical with the *senegin* of Gehlen.

ANALYSIS BY

Fenuille, *Journ. Chim. Med.* ii. 437.	Dulong, d'Astafort, *Journ. Pharm.* 1827, 567.
Colouring matter, of a pale yellow.	Peculiar alkaline matter.
Bitter matter.	Resin.
Gum.	Gummy matter.
Pectic acid.	Colouring ditto, analogous to wax
Albumen.	Yellow matter.
Volatile oil.	A substance turning to red by the action of sulphuric acid.
Fatty oil.	Pectic acid.
Malate of lime.	Phosphate of lime.
Sulphate, carbonate, and phosphate of lime.	Malate of potass and lime.
Carbonate of potass.	Sulphate of potass.
Chloruret of potassium.	Chloruret of potassium.
Silex.	Iron.

Medical Properties.—This root is sudorific and expectorant in small doses, and emetic and cathartic in larger ones. More than ninety years have elapsed since Dr. Tennant, of America, invited the attention of physicians to this medicine as an antidote to the bite of the rattle-snake; and a reward was voted him by the legislature of Pennsylvania for the promulgation of this supposed property. It was from the Senegaroos, a tribe of Indians, that he obtained a knowledge of this their secret remedy; which they applied externally and internally. Dr. Tennant himself saw, or thought he saw, beneficial effects ensue: but when we consider the number of cases of recovery from the bite of this serpent, under every variety of treatment, as recorded in many American publications, we naturally infer that spontaneous recoveries are perhaps as frequent as those which are promoted by medicine.

More certain success appears to attend the use of Senega in pneumonia and some diseases related to it. In the advanced stages of pneumonic inflammation, after venesection and the other usual remedies have been carried to their proper extent, and the cough still remains dry and painful, the debility of the patient forbidding further depletion, it is said to afford very marked relief by promoting expectoration and relieving the tightness and oppression of the chest. Various medical writers have spoken favourably of its employment in these cases, amongst whom are Bigelow, Bouvart, De Jussieu, and Lemory.

Benefit has been derived in asthma from the use of the plant. "Decoction of Seneka," says Dr. Bree, "is eminently useful in the first species, administered to old people; but in the paroxysms of young persons I have found it too irritating. This distinction applies to convulsive asthma purely uncomplicated, but the disease is frequently observed in middle-aged and elderly persons to take the character of *peripneumonia notha* in the winter and spring, and seneka is then the most useful medicine that I have tried. In such cases it should be united with the acetated ammonia, during the febrile state, and as this state gives way, the addition of squill and camphorated tincture of opium will be found to promote expectoration, perspiration, and urine in a most powerful manner."

Sir Francis Millman, Dr. Percival, and others, have spoken highly of it as a diuretic in dropsies; and in consequence of its well ascertained power of exciting salivation, it was introduced into notice by Dr. Archer of Maryland, as a remedy of great power in croup. In the early stages of this complaint, however, it may be questioned, as Professor Bigelow justly observes, how far a medicine, which acts as a stimulant to the fauces and neighbouring organs, is entitled to reliance in a local inflammation of the trachea. Dr. Barton and other celebrated medical practitioners in America, place great reliance on it as an auxiliary to the other remedies that are usually employed in croup; and a series of well-conducted experiments by any able man in our country, to ascertain its real merits in this disease, would be a boon gratefully received by the profession. Dr. Archer's mode of administering it is, to give a tea-spoonful of a strong decoction once or twice in the hour, according to the urgency of the symptoms; and during the intervals, a few drops occasionally, to keep up a sensible action upon the mouth and throat, until it acts as an emetic or cathartic. For amenorrhæa, a saturated decoction, given to the extent of a pint in twenty-four hours, commenced about a fortnight before the expected menstrual period, has been found a very beneficial practice. In consequence also of its universally stimulant and diaphoretic effects, it has been found a powerful remedy in the treatment of chronic rheumatism.

Dose.—In powder, from twenty to thirty grains.

Decoctum Senegæ. *L. E.*

"Take of the root, *one ounce,* water, *two pints.* Boil down to a pint and strain." Dose, one to three ounces three or four times a day.

POLYGALA RUBELLA.—*Bitter Milk-wort.*

Spec. Char. "*Stems* simple, *Leaves* linear, oblong, mucronated. *Flowers* racemed; those of the stem winged; those of the root apterous."—*Big.*

Syn.—Polygala Rubella, *Muhlenberg, Catal.*; *Bigelow Amer. Med. Bot. t.* 54; *Pursh. v.* 2. 464; *Willd. Sp. Pl. v.* 3. 875. *Nuttall Gen.* 2. 87.

Native of North America, in dry, gravelly, or sandy soils; flowering in June and July.

The root somewhat fusiform, perennial, and branching. Stems numerous, ascending, smooth, angular, simple. Leaves scattered, smooth; the lower ones obovate, smaller; the upper ones linear-lanceolate, obtuse, mucronated, sessile. Flowers purple, short-crested, in terminal racemes; bractes small, ovate-lanceolate, caducous: corolla small, of three segments, the middle one largest and crested.

Medical Properties.—Like some of the European species, this plant is a powerful bitter, imparting its sensible properties both to water and to alcohol. It has long attracted the notice of medical practitioners in the United States of America, and is administered in small doses as a useful tonic and stimulant to the digestive organs. In large doses it operates as a cathartic, and excites diaphoresis. "Its powers," says Dr. Bigelow, "appear to resemble those of Polygala *vulgaris*, and P. *amara* of Europe, to which it has a close botanical resemblance; and which have enjoyed a certain degree of medicinal reputation as tonics and expectorants."

One species of Polygala, viz. *P. venenosa*, is affirmed to be possessed of deleterious properties. It is a native of Java, and Commerson says, "that even from gathering a few of its leaves and branches, he was attacked with giddiness, sickness, and other unpleasant symptoms.


a
b
c
d
e
f
g
h





f



d



i



h



moschata

MYRISTICA MOSCHATA.

Aromatic, or True Nutmeg Tree.

Class XXII. Diœcia.—*Order* XII. Monadelphia.

Nat. Ord. Holoraceæ, *Lin.* Lauri, *Juss.* Myristiceæ, *Brown.* Laurinæ Myristicaceæ, *Burn.*

Gen. Char. Male. Perianth single, subpetaloid, bell-shaped, 3-cleft. *Filaments* united in a columnar tube. *Anthers* 6 or 10 cohering.

Female. *Calyx* 0. *Corolla* bell-shaped, 3-cleft, deciduous. *Style* 0. *Stigmas* 2. *Seed* solitary, inclosed in a coriaceous many-cleft arillus (Mace.)

Spec. Char. *Leaves* eliptic-oblong, smooth, pointed, paler beneath, with simple parallel nerves. *Perianth* of one leaf, coriaceous, urceolate. *Peduncles* with few flowers.

Syn.—Nux moschata, fructu rotundo, *Bauh. Pin.* 407 ; *Pluk. Phyt. t.* 219.
Nux Myristica seu Pala, *Rumph. Herb. Amb. v.* 2. *p.* 14. *t.* 4.
Myristica aromatica, *Lam. Act. Par.* 1788. *p.* 155. *t.* 5—7 ; *Lam. Dict. v.* 4. *p.* 385 ; *Lam. Ill. t.* 382 ; *Roxb. Pl. of Corom. v.* 3. *t.* 267.
Myristica officinalis, *Lin. Suppl. p.* 265; *Gært. de Fruct. v.* 1. *p.* 194. *t.* 41. *f.* 1 ; *Hook. Exot. Fl. t.* 155, 156 ; *Bot. Mag. N. S. v.* 1. *t.* 2756, 2757.
Myristica moschata, *Willd. Sp. Pl. v.* 4. *p.* 869; *Spreng. Syst. Veg. v.* 3. *p. p.* 64 ; *Thunb. in Act. Holm.* 1782. *p.* 45 ; *Woodv. t.* 134.

Foreign.—*Le muscadier ; Noix muscade,* Fr. ; *Moscada ; Nuez moscada,* Sp. ; *Moscadeira ; Noz moscada,* Port. ; *Muskatnuss,* Ger. ; *Muskot-trad.* ; *Jaéphal,* Hind. ; *Jatiphalo,* Sans. ; *Pela,* Malay.—Of the Mace. *Macis,* Fr. It. ; *Macias,* Sp. ; *Moshat blumen,* Ger. ; *Jawatri,* Hind. ; *Jatipatri.* Sans. ; *Benga Pela,* Malay.

The Nutmeg, called *Nux myristica*, or balsam not, by the old writers, from the Greek μυριστικος, *balsamica*, is a diœcious tree, a native of the Moluccas, or Spice Islands ; but is principally confined to that group denominated the islands of Banda, lying in

lat. 4° 30′ south, where it bears blossoms and fruit all the year. The islands comprehended under this general name are Banda or Lantor, Neira, Pulo Ay or Way, Pulo-Rhon, Pulo-pisang, Rossingen, Pulo-prampon, Pulo-suanjee, Capal, and Gonong or Guenanape, the last being a volcanic islet rising two thousand feet above the level of the sea. They are all small, Banda Proper or Lantor, one of the largest being only about eight miles long, and not more than three broad. The soil of all these islands, except that of Gonong, which is for the most part lava, is an exceedingly rich black mould, which renders them fertile in tropical fruits; but their chief and well-known production is nutmegs, for the cultivation of which Neira, Lantor, Pulo Ay, and Pulo-Rohn are laid out in parks or plantations.

This tree is compared by Rumphius to a common pear-tree with respect to size and appearance; it is said to bear fruit at ten years' growth, which improves in quality, and increases in quantity, until the tree has attained the age of an hundred years. The trunk rises to the height of twenty or twenty-five feet, clothed with a greyish-brown and tolerably smooth bark, abounding in a yellow juice, and bearing many whorls of spreading branches. The leaves, which stand alternately on short petioles, are from three to six inches long, sub-bifarious, oblong, glabrous, pointed, rather obtuse at the base, undulated, entire, of a dark green colour, and somewhat glossy above, beneath much paler, but neither pulverent nor downy; with simple, parallel nerves, a little branched at the extremities towards the margin, prominent, and of a brownish colour beneath. When bruised, the leaves are slightly aromatic. The flowers are present at the same time with the fruit, in axillary, subumbellate racemes, and are supported on smooth, subclavate foot-stalks, each pedicel or flower-stalk having a quickly deciduous bractea at the summit. The stamineous flowers are from three to five or more on a peduncle. The perianth is single, urceolate, petaloid, and not inaptly compared by Rumphius to the flower of the *Lily of the Valley*, which it resembles in size and form; it is of a thick fleshy texture, clothed with a very indistinct pubescence, of a dingy pale yellowish colour, and cut into three, rarely into four erecto-

patent teeth at the extremity. The filaments are united into a whitish cylindrical column, rounded at the top, and having the upper half covered by about 11 longitudinal, linear-oblong, 2-celled anthers, free at their base, opening longitudinally, and charged with a yellow pollen. The pistilline flowers are scarcely recognizable, at first sight, from the stamineous ones, except that the pedicel is very frequently solitary, on the peduncle. The pistil is solitary, shorter than the perianth, broadly ovate, a little tapering upwards, into a short style, and bearing a 2-lobed persistent stigma. "As the germen swells the perianth falls away; the former then becomes obovate, and from its weight pendent, constituting nearly a spherical drupe, of the size and somewhat of the shape of a small pear. The flesh, which abounds in an astringent juice, is of a yellowish colour without, almost white within, and four or five lines in thickness: this opens into two nearly equal longitudinal valves, and presents to view the *nut*, surrounded by its arillus or *mace*, which soon drops out, and the arillus withers: the arillus is thick, between horny and fleshy, much laciniated, folded and anastomosing towards the extremity, enveloping the nut almost entirely, and so tightly as to form inequalities on its surface. The colour when fresh is a brilliant scarlet. When dry it becomes much more horny, of a yellow-brown, and very brittle. The nut is broadly ovate or oval, the shell very hard, rugged, dark-brown, glossy, about half a line thick, pale and smooth within. This immediately envelops the seed (the nutmeg as sold in our shops) which is of an oval or elliptical form, pale brown, quite smooth when first deprived of its shell, but soon becoming shrivelled, so as to have irregular, vertical lines or furrows on its surface. Its outside is very thin; its inner substance or albumen is firm, but fleshy, whitish, but so traversed with red-brown veins which abound in oil, as to appear beautifully marbled. Near the base of the albumen, and imbedded in its substance, is situated the *embryo*, which is large, fleshy, yellowish white, rounded below, where the radicle is; the *cotyledons* are two, large, somewhat foliaceous, plicate lobes, in the centre of which is seen the plumule." The figure here given represents a stamineous plant

of the Myristica *moschata*, the natural size.—Fig. (*a*) stamineous flower cut open to show the column of stamens; (*b*) anther, copied from Roxburgh; (*c*) pistilline flower cut open to show the pistil; (*d*) young fruit; (*e*) ripe fruit in the act of bursting; (*f*) section of a fully-formed fruit, showing the nut included in the mace, *natural size*; (*g*) the mace from which the nut has been removed; (*h*) the nut; (*i*) the seed or nutmeg; (*j*) nut cut through vertically, showing the ruminated albumen and the embryo imbedded in the base of it; (*k* and *l*) the embryo—only the two last are magnified.

According to Dr. Ainslie, the nutmeg-tree has of late years been cultivated at Batavia, Sumatra, and Penang. An inferior and long-shaped kind of nutmeg is common in the island of Borneo, and there is a wild sort (*cat jadicai*) frequently to be met with in the woods of southern India, especially in Canara, which Dr. Buchanan thinks might be greatly improved by cultivation. This is the *Myristica tomontosa* of Willdenow. The *Nux moschata fructu oblongo* of Caspar Bauhin, and the *Nux Moschata mas oblongior* of Lobel. The odour of the fruit of this plant is but slight, and the flavour rather disagreeable, the oil yielded both by its mace and seed is less in quantity and inferior in quality to that of the true nutmegs; and hence it is little esteemed and seldom met with in commerce. The true nutmeg-tree now grows to a considerable size in certain sheltered situations in the Tinivelly district, especially at Courtalun, and bears pretty good fruit; it is also said to grow in the island of Ceylon, where it has obtained the Cingalese name of *sadikka*. Three other species of Myristica are also said to grow in that country. Mr. Crawford, in his history of the Indian Archipelago, informs us that there are no less than eight cultivated varieties of this tree in the Indian islands; and M. de Comyn states that two sorts grow in the Phillippine islands, one shaped like a pigeon's egg, the other perfectly spherical.

The nutmeg has been supposed to be the κώμακον of Theophrastus, but there seems little foundation for this opinion; nor can it with more probability be affirmed to be the χρισοβαλανος of Galen. Our first knowledge of the nutmeg, as well as the

clove, was evidently derived from the Arabians, long before the East India Islands were discovered by the Portuguese. By Avicenna, who flourished about the year 1160, it was called *Jiansiban* or *Jansiban*, which signifies *Nut of Banda*. Rumphius, who both figured and described this tree, says it was called by the Arabians *Giauzbaut*, *Jauzialbaud* and *Gjauz Bawa*, which means *Aromatic Nut*. The figure given by Rumphius is, however, so imperfect, and the description so confused, that Linnæus, who gave it the generic name Myristica, was unable to assign its proper characters. Sonnerat's account of the *muscadier* is still more erroneous, and nothing was known of the plant that produced this precious fruit, till M. Ceré, director of the Royal Gardens, in the Isle of France, communicated specimens and observations to the Chevalier de Lamarck. For our beautiful drawing and description, we are indebted to Samuel Curtis, Esq. proprietor of the Botanical Magazine; the former was executed by the Rev. L. Guildng, who has supplied Dr. Hooker with many other of the figures that have embellished the new series of that valuable work.

In 1602, the Dutch having subjected the original inhabitants, were the first European occupiers of the Banda isles. In 1609, they entered into a treaty with the Oraucais or natives, who bound themselves to send all their nutmegs and mace to the Dutch fort of Nassau, in the island of Nera, at a fixed price, while the Dutch pledged themselves to defend the natives against enemies, and particularly against the Portuguese. The breach of this agreement by the natives, and the murder of the Dutch commissary, occasioned hostilities between the two powers. In 1616, a similar treaty was entered into with the English, who were then at war with the Dutch; but this also was broken by the inhabitants of Banda. The English having refused, after they had made peace with the Dutch, to join them in the reduction of the Banda isles, the latter attacked them in 1621, and compelled the natives to deliver up their towns, their forts, their arms, and all their islands. In order to secure to themselves the nutmegs and mace which these islands produced, the Dutch erected forts in all of them, and divided the soil into orchards, which they distributed

among the Dutch colonists in proportion to the number of their slaves. The Banda isles were taken from the Dutch by the English Admiral Ranier in 1796, and in 1801 were restored to them by the treaty of Amiens.

The chief settlement of the Dutch is in the island of Nera, which has an excellent harbour, commanded by the cannon of the forts Belgica and Nassau. The island of Banda, which is about eight miles long, and five broad, contains twenty-five nutmeg fields, which produce annually 570,000 pounds of nutmegs, and 140,000 pounds of mace, called the flower of nutmeg. The hurricane of 1778, however, nearly annihilated the nutmeg trees of this island. These nutmeg fields occupy about 70,000 square toises. In all the other islands nutmegs are also produced in more or less abundance, and the trees flourish even amidst the lava of Gonong.

The real quantity of these valuable spices produced in the Banda isles, has been stated as follows :—In the year 1796, the annual produce was 163,000 pounds of nutmegs, and 46,000 pounds of mace. Between the years 1796 and 1798, the English East India Company imported 817,312 pounds of cloves, 93,732 pounds of nutmegs, and 46,730 pounds of mace, and about a third part more in private trade. In the year 1737, the Dutch East India Company sold at one time 280,964 pounds of nutmegs. In 1756, 241,427 pounds were sold; and in 1778, 264,189 pounds. The average has been considered to be about 250,000 pounds annually, which was sold in Europe at seventy-five livres per pound, exclusive of 100,000 pounds sold in the Indies. The average quantity of mace has been 90,000 pounds annually, and 10,000 in the East Indies.

"The Dutch having possession of the Spice Islands in 1619, encouraged, to the utmost of their power, the cultivation of the nutmeg, in a few of them, and were anxious, for the sake of the monopoly, to have the trees there so exclusively, that they either destroyed them themselves, in the remainder of the isles, or kept their princes in their pay for the purpose of doing so. In fact, they pursued the same line of policy with the nutmeg, as hath been already described with regard to the clove. They have, more than once, suffered dearly for their insatiable avarice; for the dreadful hurricanes and earthquakes, which spared other islands, nearly annihilated the nutmegs of Banda in 1778; so that the

Dutch were only able to have a few supplies for several years afterwards. While the Dutch remained undisputed possessors of the Spice Islands, the quantity of nutmegs and mace exported from their nutmeg-grounds, circumscribed as they were, was truly enormous. Stavorinus, in his 'Voyage to the East Indies,' gives an excellent account of the commercial history of this spice. A quantity, estimated at no less than 250,000 pounds annually, used to be vended in Europe, and nearly half that amount in the East Indies. Of *mace*, the average has been 90,000 pounds sold in Europe, and 10,000 pounds in the East Indies. When the Spice Islands were taken by the British, in 1796, the importations of the East India Company into England alone, in the two years following the capture, were, of nutmegs, 129,732 pounds, and of mace, 286,000 pounds. When the crops of spice have been superabundant, and the price likely, in consequence, to be reduced, the same contracted spirit has actuated the Dutch to *destroy* immense quantities of the fruit, rather than suffer the markets to be lowered. A Hollander, who had returned from the Spice Islands, informed Sir William Temple, that, at one time, he saw three piles of nutmegs burnt, each of which was more than a church of ordinary dimensions could hold. In 1760, M. Beaumaré witnessed, at Amsterdam, near the Admiralty, the destruction by fire of a mass of spice, which was valued at one million of livres, and an equal quantity was condemned to be burnt on the day following: and Mr. Wilcocks, the translator of Stavorinus's Travels, relates, that he himself beheld such a conflagration of cloves, nutmegs, and cinnamon, upon the little island of Newland, near Middleburgh in Zealand, as perfumed the air with their aromatic scent for many miles round.

"M. Poivre had the honour of introducing this valuable plant into the isles of France and Bourbon, in 1772, together with the clove; thence, by the liberal policy of the French, it was sent to Guiana and to the West-India Islands.

"In 1796 the British took possession of the Molucca Isles, and two years afterwards planted the nutmeg at Bencoolen, in Sumatra, where it is grown in the greatest luxuriance; so that in five years, the trees had arrived from ten to fourteen feet in height, and in October and November 1802, two hundred and forty-seven trees, out of about six hundred, blossomed. About half of these were male and the rest female. A second importation was made to that island by the assistance of the Bengal government; and the son of Dr. Roxburgh arrived there with twenty-two thousand nutmeg plants from Amboyna, which, in a few years, yielded 200,000 pounds weight of nutmegs, and 50,000 pounds of mace.

"In the Moluccas, the Dutch appear to have been totally ignorant of the diœcious nature of the trees, and of the cause of sterility in so many of them. Where the trees are very abundant, this is a matter of comparatively trifling importance: but in colonies where but few plants have been introduced, it is not only of essential consequence that the female flowers should be fertilized by the male, but that the male plants should be employed in the most economical manner. This has been achieved by M. Joseph Hubert, in the Isle of France, in the most successful manner. Ascertaining that one male plant is sufficient for a hundred females, he resolved upon grafting the seedling stock of all his

plantations in that proportion, in the second year of their growth: by this means there are no superfluous trees, and they come into bearing the sooner. According to the old method, the trees did not bear flowers till the seventh or eighth year; and it was not till that period, that the useless trees could be removed.

"In our West-Indian colonies, the nutmeg was introduced about thirty years ago; and first, to the island of St. Vincent, from Cayenne, though not without great difficulty, on account of the extreme jealousy of the inhabitants of that colony, the two countries being then at war with each other. The three trees which were originally imported, have borne fruit for many years, and have atttained the height of twenty feet, with a trunk eight or nine inches in diameter. It does not, however, appear, that the culture of the nutmeg succeeds so well in the West, as in the East Indies. Mr. Lockhart, who has the charge of the plants introduced into the island of Trinidad, by his excellency Sir Ralph Woodford, observes, in a letter to me, that the plants flourish best in the rainy season; even when moderate showers fall requiring constantly artificial watering; although a soil saturated with moisture is injurious. For a long time, though the trees introduced into St. Vincent produced abundance of flowers, they bore small crops of fruit, until Mr. Guilding recommended the same process as is employed, with the caprification of the fig, when the crops were much more productive, two trees at one period bearing three hundred ripe fruits. The process of grafting adopted in the Mauritius might be employed perhaps, to still greater advantage. Female flowers, which had reached perfection on the 20th of June, became ripe fruit from the 6th to the 12th of February following: this is the case, at least, in the island of St. Vincent, according to Mr. Guilding, who further observes, that the trees are almost always in flower; that fruit is most abundant in April, May, and June; and that the seed vegetates at the expiration of six weeks from the period of its being put in the ground.

"In the East Indies, as I have already observed, the trees are almost *always* loaded with flowers and fruit. In the Moluccas, the gathering of the fruit takes place at three periods of the year; in July and August, when the nutmegs are most abundant, but the mace is thinner than in the smaller fruits, which are gathered during November, the second time of collecting: the third harvest takes place in the month of March, or beginning of April, when the nuts, as well as the mace, are in the greatest perfection, their number being then not so great, and the season being dry. The outer pulpy coat is removed, and afterwards the *mace*, with a knife. The *nuts* are placed over a slow fire, when the shell becomes very brittle, and the *seeds* or *nutmegs* drop out: these are then soaked in sea-water, and impregnated with lime, a process which answers the double purpose of securing the seeds from the attack of insects and of destroying their vegetating property. It further prevents the volatilization of the aroma. The mace is simply dried in the sun, and then sprinkled with salt water, after which it is fit for exportation."*

* Curtis' Botan. Mag. N. S. vol. i.

Qualities and Chemical Properties.—Nutmegs should be chosen large, of the shape of an olive, *heavy*, and firm, of a lightish grey colour on the outside, beautifully striated, and reddish within: of a strong fragrant odour, warm aromatic taste, and of an unctuous feel. The oblong kind, and the smaller ones, should be rejected. Distilled with water, they yield a large quantity of essential oil, resembling the spice itself in flavour; after the distillation, an insipid subaceous matter is found swimming on the water; the decoction, inspissated, gives an extract of an unctuous, very slightly bitterish taste, with little or no astringency. Rectified spirit extracts the whole virtue of nutmegs by infusion, and elevates very little of it in distillation; hence the spirituous extract possesses the flavour of the spice in an eminent degree. From an analysis by Neumann, it appears that the components of nutmegs are starch, gum, volatile oil, wax, and a fixed fat oil.

But the examination of M. Bonastre is the most satisfactory that has hitherto been made. He found that 500 parts consist of

A white insoluble matter (Stearine)	120
A coloured soluble butyraceous matter (Elaine)	38
Volatile oil	30
Acid (*per approximation*)	4
Fecula	12
Gum (either natural or produced)	6
Ligneous residue	270
Loss	20
	500

Journ. de Pharmacie, IX. 281.

The volatile oil, in which the active properties of the nutmeg chiefly reside, is of a pale-straw colour, limpid, transparent, and lighter than water. The expressed oil, erroneously called oil of mace, when first drawn, is limpid and yellow, but on cooling, acquires the consistence of spermaceti, and somewhat the appearance of Castile soap, being whitish, mottled with reddish brown. Its odour is agreeable, and slightly aromatic, and its taste fatty, pungent, and bitterish. It appears to be a vegetable cerate, consisting of fixed oil, volatile oil, and wax. "Nutmegs are frequently punctured and boiled in order to obtain the essential oil, and the orifices afterwards closed with powdered sassafras."

Oil of Nutmegs is expressed from imperfect nutmegs, and such as are unfit for the European market: there are three sorts of it, commonly called *oil of mace*. The best is brought in stone jars; softish, of a yellow colour, an agreeable fragrant

smell, greatly resembling that of the nutmeg. This is denominated Banda soap, and should be chosen free from impurities, and of a good colour. The next comes from Holland, in solid masses, generally flat, and of a square figure: paler coloured, weaker in smell, and inferior in its quality to that of India. The last is the worst, and seems to be a composition of suet, palm oil, or some such matter, flavoured with a little genuine oil.

Mace is a thin, flat membranaceous substance enveloping the nutmeg; of a lively reddish brown or saffron colour, of a pleasant aromatic smell, and a warm, bitterish pungent taste. Mace should be chosen fresh, tough, oleaginous, of an extremely pungent smell, of a bright reddish yellow, the brighter the better; the smaller pieces are esteemed the best. The state it is in when packed, should be particularly attended to: if it be too dry, it will be broken, and lose much of its fragrance; if too moist, it is subject to decay and to breed worms. It should be packed in bales, pressed down close and firm, whereby its fragrance and consistence will be preserved.

Medical Properties and Uses.—Nutmegs, which are universally known as a kind of delicate spice, are chiefly employed in medicine to impart their grateful aromatic flavour, and to obviate the irritating effects of drastic purgatives. They are supposed to be cordial, carminative, anodyne, and astringent; and with a view to the last-mentioned effects, they have been used in diarrhœa and dysentery. Given in large quantities, the nutmeg produces stupor, drowsiness, and other symptoms of narcotic poisons, in consequence of which Cullen warns us not to administer it to patients disposed to apoplexy. Bontius also speaks of their anodyne effects as a frequent occurrence in India. The *volatile oil*, possessing the taste and odour of the fruit in a concentrated degree, is occasionally used as an external stimulant; and the *expressed oil*, improperly called oil of mace, is generally prescribed in the same manner.

Dose.—The dose of the nutmeg (which is sometimes employed to relieve nausea and vomiting, or to check diarrhœa, when given in wine) is from four grains to a scruple: of the *volatile oil*, from two to eight drops. Custom, however, reconciles the constitution to much larger quantities than could be borne by untutored stomachs. In India, the consumption of nutmegs as a condiment, is immense: in the Moluccas, the natives mix them with all their food, and drink, and medicines; they even chew them as a masticatory, and eat them preserved both in salt and sugar.

Mace is also chiefly used for culinary purposes; but, according to Dr. Ainslie, it "is a favourite medicine with the Hindoo doctors, who prescribe it in the low stages of fever, in consumptive complaints, and humoral asthma; and also, when mixed with aromatics, in wasting and long-continued bowel complaints, in doses of from eight to twelve grains, and sometimes to as much as half a drachm; but they generally administer it cautiously, from having ascertained that an overdose is apt to produce dangerous stupor and intoxication."

Tinctura Nucis Moschatæ.

℞. Nucis Moschatæ contriti, ℥iii.
Spirit. vini ten. lbij. M.

Off. Prep.—Spiritus Myristicæ. *L. E.*
Spiritus Lavandulæ compositus. *L. E. D.*
Mistura Ferri composita. *L.*



Solidago Virgaurea ?

SOLIDAGO VIRGAUREA.

Common Golden-rod.

Class XIX. SYNGENESIA. *Order* II. POLYG. SUPERFLUA.

Nat. Ord. COMPOSITÆ, γ, DISCOIDEÆ, *Lin.*
CORYMBIFERÆ, *Juss. De Cand. &c.*
ASTERINÆ, ASTERACEÆ, *Burn.*

SPEC. CHAR. *Receptacle* naked. *Down* simple. *Involucrum* imbricated, with close scales. *Capitula* radiant. *Florets* of the radius about five.

SPEC. CHAR. *Stem* slightly zizgag, angular. *Clusters* downy, panicled, crouded, erect. Upper *leaves* lanceolate, narrow at both ends; lower elliptico-lanceolate, hairy, partly serrated.

Syn.—Virga aurea, *Raii Syn.* 176; *Ger. Em.* 430. *f. Park.* 542: *Camer. Epit.* 748. 749. *f. f*; *Matth. Valgr. v.* 2. 354. *f. Dod. Pempt.* 142. *f.*
Virga aurea vulgaris latifolia, *Bauh. Hist. v.* 2. 1062. *f.*
Solidago n. 69. *Hall. Hist. v.* 1. 29.
Solidago vulgaris, *Gray Nat. Arrang. of Brit. Pl. v.* 2. *p.* 465.
Solidago Virgaurea, *Lin. Sp. Pl.* 1235; *Willd. v.* 3. 2065; *Fl. Brit.* 889; *Eng. Bot. v.* 5. *t.* 301; *Hook. Scot.* 244. *Stokes, v.* 4. 219.

FOREIGN.—*La verge d'or*; *Verge doreé*, Fr.; *Verga d'oro*, It.; *Vara de oro*, Sp.; *Vara d'oiro*, Port.; *Die Goldruthe*; *St. Peterstab*; *Gülden Wundkraut*, Ger.; *Gulbris*, Swed.; *Solotoschnik*, Rus.

ONE species only of the genus Solidago is found in this country, but it is subject to many varieties, some of which have been considered specifically distinct, such especially as the S. *Cambrica* of Hudson The Golden-rods are almost entirely North American plants; they are all perennial, mostly herbaceous, with simple undivided leaves, generally bearing small yellow flowers, in long slender spikes or panicles, whence the names of *Virgaurea* and Golden-rod. Few of the species were known to Linnæus, but the Hortus Kewensis, enriched from Dr. Solander's manuscript,

has thrown great light on the present genus. Linnæus, in his Systema Vegetabilium, ed. 14, has only fourteen species of Solidago. Willdenow, profiting by Mr. Aiton's work, enumerates forty. Mr. Pursh reckons up fifty-one North American species alone. Sir J. E. Smith describes also fifty-one; and Sprengel enumerates in his catalogue sixty-three.

The Solidago *Virgaurea* inhabits woods, copses, and grassy lanes, and is found among furze on heaths and mountainous situations, throughout Europe as well as at *Labrador*, and even in China, flowering from July to September. Our drawing was made from a specimen growing on Hampstead Heath, and we have found it in most of the woods about London.

The root is woody, somewhat curved, and furnished with long simple fibres. The stem generally rises from one to three feet high; it is erect, leafy, slightly zigzag, never quite straight, angular, solid, and downy, giving off several short branches towards the top. The leaves are of a dull green colour above, paler underneath; the lower ones stalked, elliptic-oblong, pointed, more or less serrated, rarely altogether entire, very rough, and clothed with a rigid down; the stem leaves smaller, and gradually diminishing to lanceolate bracteas, more entire, nearly sessile, alternate, and downy like the flower-stalks. The flowers are of a bright, yellow colour, in terminal and axiliary clusters, forming a dense leafy panicle, or corycomb, which varies exceedingly in magnitude, and in the number and size of the flowers, in elevated situations being shorter, more dense, and less divided. The scales of the involucrum are erect, lanceolate, downy, membranous at the edges and finely fringed. The florets of the disc are numerous, tubular, with five equal segments; those of the radius from six to ten, elliptic-oblong, 3-toothed, spreading: in decay becoming revolute and tawny. The filaments are capillary, short; and the anthers united into a cylindrical tube. The fruit is ovate, minutely hairy; the down appearing rough when viewed with a magnifier. The receptacle is naked, punctured, slightly cellular, and toothed at the margin.—Fig. (*a*) floret of the disc; (*b*) floret of the radius; (*c*) the involucrum; (*d*) the receptacle.

Qualities.—When bruised, the whole herb has a slightly aromatic smell, and a weak astringent taste. Its active matter is extracted by boiling water, and by alcohol; both solutions strike a black colour with the sulphate of iron, and from their slight astringency they probably contain a small portion of tannin.

Medical Properties and Uses.—This plant is astringent and tonic. It has been much commended by the ancient writers as a remedy against stone in the bladder, in urinary obstructions, cystorrhœa, and ulcerations of the urinary organs. From its astringent powers, it may be employed with advantage in diarrhœa; and in calculus, in common with other remedies, of this class, may occasionally prove beneficial; but it is seldom used in modern practice, either in this country or on the continent. It has been recommended also as a styptic both externally and internally; and from its reputed vulnerary qualities, it is called in some places *woundwort*, which is also a name given to many other plants. Gerarde says, "It is extolled above all other herbs for the stopping of blood in sanguinolent ulcers, and bleeding wounds; and hath in times past been had in greater estimation and regard than in these dayes; for in my remembrance, I have known the dry herbe which came from beyond the sea sold in Bucklers Bury in London (the Covent Garden of those times) for half a crowne an ounce. But since it was found in Hampstead Wood, euen as it were at our own towne's end, no man will giue half a crowne for an hundred weight of it; which plainly setteth forth our inconstancie and sudden mutabilitie, esteeming no longer of any thing, how pretious soever it be, than whilst it is strange and rare." Its dose may be from grs. x. to ʒj, or more, twice or thrice a day.

SOLIDAGO ODORA.—*Sweet-scented Golden-rod.*

SPEC. CHAR. *Stem* nearly smooth. *Leaves* linear-lanceolate, entire, smooth, with a rough margin, and covered with pellucid dots. *Racemes* panicled, one sided.

Syn.—Virga aurea Americana, tarraconis facie, et sapore, panicula speciosissimâ, *Pluk. Phytol. t.* 116. *f.* 6.
Solidago *odora, Ait. Hort. Kew, ed.* 2. *n.* 15; *Willd. n.* 22; *Pursh. n.* 24.

THIS plant is a native of America, growing in dry sunny situations, on fertile woodlands, from Canada to Carolina, principally throughout the Allegany mountains, flowering from August to October. The leaves have a delightful fragrant odour, partaking of anise and sassifras, but different from either. It yields on distillation a volatile oil, possessing the taste and aroma of the plant in a high degree. This oil appears to reside in the transparent cells, which constitute the dotting of the leaves, the root being wholly destitute of the fragrance of the herb.

This species of Solidago is said by Professor Bigelow to be a pleasant aromatic, stimulant, diaphoretic, and carminative. An essence made by dissolving the essential oil in proof spirit is used as a remedy for complaints attended with flatulency, and as a vehicle for unpleasant medicines of various kinds. It allays vomiting and spasmodic pains in the stomach, and from its pleasant flavour, covers the taste of laudanum, castor oil, and other medicines which the stomach frequently rejects.

Mr. Pursh states that the plant is dried in some parts of the United States as an agreeable substitute for tea; and that it has for some time been an article of exportation to China, where it fetches a high price.



Alatonia Cardamomum.

ALPINIA vel MATONIA CARDAMOMUM.

The Lesser or Malabar Cardamom.

Class I. MONANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. SCITAMINEÆ, *Lin. Brown, &c.* CANNÆ, *Juss.* SCITAMINÆ, ZINGIBERACEÆ, *Burn.*

GEN. CHAR. *Capsule* 3-celled and 3-valved, with a central receptacle. *Anther* of two distinct lobes. *Filament* with two triangular lobes at the base, emarginate and simple at the summit. Outer limb of the *corolla* in three oblong lobes; outer a single lip. *Seeds* rough, tunicated.

SPEC. CHAR. *Leaves* elliptic-lanceolate, acute. *Calyx* notched. *Capsule* ovate-oblong, obtusely triangular.

Syn.—Cardamomum simpliciter in officinis dictum Cardamomum verum, Angl. *Bauh. Pin. p.* 441.

Cardamomum cum siliquis sive thecis brevibus, *Bauh. Hist. Plant. v.* 2. *lib.* 15. *p.* 204.

Elletari, *Van Rheede Hort. Malab. v.* 2. *p.* 9. *i.* 4, 5.

Cardamomum minus, *Clusii de Aromat. lib.* 1. *c.* 24. *p.* 187; *Matthiol. sur Diosc. (Pinet) p.* 6; *Bodæi Annot. in Theophrast. p.* 1014. *f.*

Cardamomum Ensal dictum, *Burman Thes. Zeyl. p.* 54.

Amomum Cardamomum, *White Trans. of Lin. Soc. v.* x. 230. *t.* 4, 5.

Amomum repens, *Sonner. Voy. tom.* 2. *p.* 240. *t.* 136; *Roscoe in Trans. Lin. Soc. v.* 8. *p.* 353.

Cardamomum minus, *Matth. Valgr. v.* 1. 25; *Camer. Epit.* 11. *f.* 3; *Ger. Em.* 1542; *Geoffr. Mat. Med. p.* 368; *Lin. Mat. Med. p.* 2.

FOREIGN.—*Petit Cardamome*, Fr.; *Amomo minore*, It.; *Cardamomo*, Sp. and Port.; *Kleine Kardamomen*, Ger.; *Kadamome*, Dan.; *Kardamome*, Rus.; *Kdkula*, Arab.; *Purbi* and *Guzrate Clachi*, Hind.; *Cupulaga*, Malay.

THE Malabar Cardamom has been regarded by most botanical writers as a species of Amomum; but Mr. Roscoe has shown that it differs in the filament or antheriferous petal not being produced beyond the anther, as in that genus. Dr. Roxburgh, in his account of the plants of Coromandel, considers it to be an Alpinia; but in this the inflorescence is terminal, whereas in the

Cardamom it issues horizontally from the tuberous annulated part of the stem: hence it has lately been removed to a new genus, called ELETTARIA, from *Elettari*, the original Malabar appellation, as given in the Hortus Malabaricus; but the difference in the mode of flowering is scarcely sufficient to form a generic character. The name MATONIA, by which it is now distinguished, was, we believe, originally suggested by Sir James Edward Smith, in honour of his friend Dr. Maton, the learned physician and naturalist, who first clearly established the genus.

We have great pleasure in presenting to the public a correct representation of the plant which yields Cardamom seeds. The botanical description and natural history were first communicated to the Directors of the East India Company, by Mr. David White, surgeon on the Bombay establishment; and it is to his paper, together with the valuable remarks of Dr. Maton, published in the tenth volume of the Transactions of the Linnean Society, that we are chiefly indebted for the account we now give.

The plant which produces the Cardamom seeds, (Matonia *Cardamomum*,) is a native of the mountainous parts of Malabar, on lofty hills, whose summits are ever clothed with clouds, growing most luxuriantly in shady places, in a moist atmosphere; flowering when the rainy season begins, in April and May, and ripening its seeds in October and November. The district of Wyniaûd, situated on the summit of the western Ghaûts, about the twelfth degree of latitude, produces the best Cardamoms in India.

The Lesser or Malabar Cardamom has a whitish perennial, annulated, tuberous root, sending off many long slender fibres. The cultivated plant does not flower till it is four years old. The stems which emerge from the root, are tuberous, clubbed, and jointed at the base for two or three inches; the lower part giving out viviparous shoots, the upper part panicles. They are erect, and tapering as the continued sheaths send off the leaves; when in bearing, they are from six to ten feet high, and from eight and twelve to thirty in number, smooth, with varying shades of glossy green, and pale at the base; which distinguishes this species from a congener frequent on the same site, but with a red or fuscous base. The leaves are alternate and sheathing, elliptic-lanceolate,

pointed, from nine inches to two feet and a half long, and from one to five inches broad, spreading, dark green, smooth, entire, pale sea-green beneath, and glossy above, with a silky softness. The midrib of the leaf on the upper surface is channelled, on the under keeled. The flowers are in panicles, which issue laterally from the tuberous jointed base of each stem near the root. The panicles are much branched, jointed, a span long, smooth, many-flowered, and spread horizontally on the ground. The bracteas are alternate, ovate, oblong, acute, at the base of each partial stalk, withering; the partial ones solitary, tubular, closely embracing the germen and calyx, almost as long as the latter, and resembling it in shape, but deciduous. The calyx is monophyllous, double, tubular, cylindrical, and 2 or 3-cleft at the margin. The corolla is monopetalous, and funnel-shaped; tube longer than the calyx, cylindrical, slender, curved; outer limb in three equal, oblong, recurved segments, inner a somewhat obovate, large, notched crenate, undivided lip, with a short claw. The filament is stout, erect, with a lanceolate, acute, horizontal lobe, simply notched at the summit, without any crest or extension beyond the anther, which consists of two oblong, distant lobes, about half the length of the filament. The germen is inferior, nearly globular, having a slender thread-shaped style lying close to the filament between the lobes of the anther, and bearing a funnel-shaped, obtusely triangular stigma. The capsule is 3-celled, with three coriaceous valves; when fresh it is fleshy, smooth, elliptic-oblong, or somewhat ovate, but becoming bluntly triangular, coriaceous and pale brown, when dried. The seeds are numerous, roundish, somewhat angular, rough, each enveloped in a fine membranous evanescent tunic. The receptacle is central, shorter than the capsule, when dry, and originally connected with the central ridge of the valve. The plate represents a full-grown Cardamom plant, with its stems cut off.—Fig. (*a*) the partial panicle with its germs and flower viewed in front; (*b*) the back view of the corolla; (*c*) the tube only of the corolla, with the inner calyx, &c.; (*d*) the same without the calyx; (*e*) part of the style, stigma, and anthers in situ; (*f* and *g*) the naked pistilla, one with the germinal appendices a little separated, the

other with the same in situ; (*h*) a half-grown germen, with the persistent inner calyx and its 3-toothed border; (*i*) the naked pistil, style, and stigma; (*jj*) longitudinal and transverse sections of the full-grown pericarp, as it is taken from the plant before drying; (*k*) two seeds, a little magnified; (*l*) the bare capsule, one side removed to show the triangular seed-receptacle; (*mm*) the Cardamom pod, as it comes to market from the drying process.

The glistening polish of its stems, (says Mr. White,) the sea-green glossy surface of its leaves waving with the least impulse, and the general symmetry of the whole, easily distinguish it from its rival neighbours in the woods. It outshines them also in the elegance of its flowers: the vivid pink, surrounded by the pale white of the spreading division of the upper border of the corolla, presents a most delicate contrast.

In Malabar, its native soil, it is simply named *Ela* or *Ela-tari*, and *Ela-channa*; the former addition signifying a young plant, the latter a full-grown one. The ripe pod is styled exclusively *Ela-tari*, *ari* in Malabar signifying any small grain: e. g. *ari* rice, *mont-ari*, natcheny or raggee.

The Cardamom Farms.—"The spots chosen for these," continues Mr. White, "called in the Malabar language *Ela-Kandy*, literally signifying Cardamom plots, are either level or gentle sloping surfaces on the highest range of the Ghaûts, after passing the first declivity from their base. The extent of climate hitherto known in Malabar to produce them, lies between 11° and 12° 30′ north latitude, or thereabouts.

"The months of February and March, are, on account of the prevailing dry weather, selected by the cutivators as the most proper for commencing their labours, the first part of which consists in cutting down the large and small trees promiscuously, leaving of the former, standing at nearly equal distances, certain tall and stately individuals, adapted to afford that degree of perpendicular shade which experience teaches them to be most favourable for the future crops. The grass and weeds are then cleared away, and the ground disencumbered from the roots of the brushwood: the large trees lie where they fall; the shrubs, roots, and grass are piled up in different small heaps, and their spontaneous and gradual decomposition fertilizes the space they cover.

"The size of the Ela-Kandy is various. The largest Mr. White saw among fifty did not exceed sixty yards in diameter. Their form varies likewise, very commonly oblong or oval, but sometimes irregularly rounded. The variety in these respects is chiefly owing to the convenience of the standard or permanent trees for shade. Those with

with lofty, straight stems, extensive heads, and those that are in an adolescent state, and known to be long-lived, are preferred for this purpose, and left standing at fifteen or twenty yards from each other. Much more diminutive plots are also cultivated by a race of Hill people called *Kourchara* and *Cadura*, who are not exactly slaves, but locally attached, and acknowledging certain obligations of a feudal, and perhaps reciprocal kind, to the Nairs in the neighbourhood.

"After the operations now described, no further labour is bestowed for four years. At the revolution of the fourth rainy season, and towards its close, they look for a crop, and their hopes are rarely disappointed; this first effort of nature is generally scanty: for instance, only one half of what is reaped the following year, and only one-fourth of what is yielded after the sixth rains, at which period the plant has reached its acme of prolific vigour. Now and then, however, this routine is interrupted, and its progress protracted, by causes of which they are not very solicitous to investigate the nature; they remark, however, excessive and uninterrupted rains to be one source of failure.

"In the dry season succeeding to the first crop, they grub up the undergrowth of shrubs, and clear away the weeds and grass, laying them up as before in heaps to rot; but in no case do they set fire to these, the consequence of which practice would be the certain failure of the crops. This process of cleansing being yearly repeated, the same spot will continue productive for fifty years and upwards.

"The barren state of the Ela-Kandy is replaced by the establishment of another, on a fresh site, and with similar properties to the former; in the choice of which they can never be at a loss, from the great extent of mountain and wood in a state of nature, and, the same operations repeated, the customary routine of crops will follow.

"As the Cardamom plants spring up from scattered seeds dormant on the spot, or washed thither by rains from the adjacent parts, we do not find any regularity in their disposition, nor is the industry of the natives ever exerted to correct this. Accordingly we see them variously grouped; in some places crowded and extremely luxuriant; in others thin and stunted; some roots sending forth from twenty to thirty stems, two-thirds or three fourths of which bear, others from eight to twelve, and down to four or five. Hence it is difficult to calculate the rate of produce of any one plant. Each stem sends forth from its thickened base from two to four strings of fructiferous panicles; from these issue alternately short clusters bearing from two to three ripe pods. The length of the common string or stalk varies from four inches to eighteen, and is sometimes two feet; but these last extremes are not fertile in proportion. In good years, from four to six plants will yield of dried pods one *dungally*, a measure of capacity equal to four pints Winchester.

"The abundance of crop is best insured by a moderate routine of weather, with respect to dry and wet: the extremes of each are injurious; they dread most, however, deluging rains, particularly for the young plantations, and during the flowering season, which commences on the first fall of the rains in April and May, and continues for two months. The flower being very delicate, and the recumbent and

repent posture of the fruit-panicles, exposes them particularly to the bad effects of drenching moisture. Repeated torrents, descending from above, commit their devastation by baring the roots, and sweeping away the finest portion of the mould, which furnishes a nutriment so essential to the vigour of the plants. In August and September the pods increase and acquire the greatest size. In the first half of October they begin to ripen; then the gathering of the early part commences; the ripening proceeds through all that month and November. A longer continuance of the rainy season may protract the final gathering till the middle of December. About a fortnight earlier than here stated, the Cardamoms on the western or sea-side of the Ghaûts are gathered. The process of reaping keeps pace with the simplicity of the previous management. A dry day being chosen, the fruit-stalks are plucked from the roots, carried to their houses, and laid out to dry on mats placed upon a threshing-floor; a series of four or five dry days is sufficient to complete the desiccation. The pods being extricated by stripping with the fingers, are separated into three or four sorts, denominated from their respective qualities:—1. *Talli-Kai*, the head fruit; 2. *Nadu-Kai*, the middle; and 3. *Poulo-Kai*, the abortive fruit. The last being thrown away, the former two are mixed together; the purpose of the separation being to ascertain the relative proportions, and to render the whole uniform and marketable. They are then laid up in mat-bags, made of the Pandanus *sylvestris* of Rumphius, a plant growing every where around their houses and fields. These bags are of two sizes, one holding thirty-two pounds avoirdupois, or a company's *maund* in Malabar, and the other sixteen pounds.

"The bundles thus prepared by the cultivator are immediately carried down to shops or little storehouses, erected by Mopla merchants or agents in different places along the whole range of hills, and at a little distance from the farms. Here they are subjected to another and final operation by the venders to the wholesale merchants on the coast. This consists in holding them over a gentle and slow fire in flat baskets, while the assistants continue rubbing them betwixt their hands for a certain time; which has the effect of detaching what remains of the permanent calyx and foot-stalks, or other adhering membranes, and gives the pod that appearance and marketable quality delineated in pl. 106, figs. *m* and *n*. This operation is termed in Malabar, *Terimbous*, a word expressive of its nature. The Cardamoms are now weighed for the purpose of ascertaining the respective quotas of rent payable by the different farmers. The result of this is expected to correspond with a previous estimation of the quantity of the crops, taken on the ground before they arrive at maturity; on the approach of which an official deputation, consisting of public officers and some of the head men of the country, well acquainted with the subject, repairs to the Ela-Kandy's, attended by the proprietors, and there the calculation is made from the combined consideration of the extent of ground, age of the plantation, and general appearance of the fruit-stalks then in full bearing. Four or five of the visitors, whose interests are supposed to be neutral, and equally unbiassed betwixt Government and the Ryot, successively and seriously deliver their opinions; from the average of which the official attendants strike a mean, and mutual satisfaction is generally the consequence. The duties, or customs, are paid only on exportation from the province: they amount

to twelve per cent., and the average price is rated at 1200 rupees per candy of 640 pounds avoirdupois.

"The total produce of Wynaûd may amount, one year with another, to something above fifty candies, perhaps fifty-six; and this grows on an extent of more than 100 miles, reckoning the sinuosities and angles of the hills. The kingdom or country of the Coorja Rajah produces less than ten or fifteen candies. The whole site of the growth of this spice on the continent of Hindostan extends from the Soubramany Ghaût, nearly due east from Mangalore, to Mannaar Ghaût in the same direction from Calicut."

Mr. White, to whom we are indebted for the preceding account of the natural history of this plant and its cultivation, under the name of Amomum *Cardamomum*, in Trans. of Lin. Soc. vol. x. speaks of the seed as amongst the most important articles in modern luxury, and as "a grateful and salubrious necessary of diet." Its general use in Asia, indeed, renders the plant a very important and profitable object of culture, though the harvest, occurring at the most unhealthy season, is not unattended by serious dangers. Fevers, fluxes, the bite of innumerable minute leeches, (Hirudo *geometra*,) and the instantly fatal sting of the whip-snake, are mentioned as not uncommon mischiefs; to which is added the caustic quality of a shrubby plant, called by the natives *Mouricha*, whose botanical characters have not been ascertained, but whose leaves produce dangerous and sometimes fatal ulcers of the skin. The profit of the Cardamom farms, however, is so considerable as to overcome all difficulties in their cultivation, and Mr. White thinks they might easily be greatly extended.

What the cardamom of the ancients was, it is now scarcely possible to determine. It is extremely probable, however, as Dr. Maton justly observes, that the article bearing that name in their materia medica, was not the common cardamom of our shops. The plant producing it was not satisfactorily made known, until the publication of the *Hortus Malabaricus*, in which the delineation of it is sufficiently striking. From the mistake made by Burmann, in referring to Bontius's Java (p. 126) for the true cardamom, appears to have originated the erroneous description and discordant references, on the subject of the cardamom in the works of Linneus; the latter illustrious author having confounded the Javanese cardamom, Amomum *compactum* of Solander, with that of Malabar. In Java the plant grows wild in the woods, and is there called *kápalúga*, but its produce is much inferior to that of the Malabar cardamom The Amomum *Cardamomum* (Cardamomum *minus* Rumph. Amb. 5. p. 152. t. 65. f. 1.) is the species, the seeds of which come the nearest in taste and virtues to the officinal article, and are said to be used as a substitute for them by the Malays. The plant is a native of Sumatra and other islands to the eastward of the bay of Bengal, and was sent, according to Dr. Roxburgh, (Flora Indica, p. 37,) to the botanical garden at Calcutta, where it blossoms in April.* Dr. Francis Hamilton, in his Account of

* "The true original Amomum of the shops, still to be met with at Venice, and in other parts of the south of Europe, is the Amomum *Cordamomum*, Cluster Cardamom, (*Lin. Sp. Pl. 2; Willd. n.* 1; *Roscoe n.* 1; A. verum, *Ger. Em.*) though generally supplanted by the more valuable lesser Cardamom, Amomum *repens* of Sonnerat, which Linneus confounded herewith."—Smith *in Rees's Cyclopædia.*

the Kingdom of Nepal, mentions a large fruited species of cardamom (Amomum ?) which he found growing there, hitherto undescribed by botanists. The plant producing the greater cardamom seeds of commerce or Grains of Paradise, is the Amomum *Grana Paradisi*, of Linneus.

The officinal cardamoms are brought to this country from Bengal in cases, each containing about 120lbs weight. The seeds are dried and imported in their capsules, by which their flavour is better preserved.

Qualities.—These seeds have an extremely grateful aromatic odour, and a warm pungent taste. They communicate all their virtues to alcohol and ether, and nearly so to water. In distillation they afford an essential oil, which is pungent to the taste, and in this seems to reside all the active qualities. "The watery infusion has a turbid appearance, and lets fall a flocculent precipitate, on the addition of alcohol, the acids, solutions of sulphate of iron, muriate of mercury, and acetate of lead; but the sulphate of iron does not alter its colour. The alcoholic tincture is rendered milky by water. The ethereal has a yellowish green hue, and, when evaporated on the surface of water, leaves neither resin nor extractive, but a considerable portion of essential oil, which has the flavour and taste of the seeds in perfection. Cardamoms, therefore, seem to be entirely composed of fecula, mucus, and essential oil."

Medical Properties and Uses.—Cardamom seeds have been long employed in medicine as a valuable cordial, carminative, and stomachic. They afford a grateful warm aromatic, less heating and stimulant than many of the other species, and are, perhaps, on this account better adapted for general use. They enter into several of the officinal preparations, and are frequently combined with bitters in dyspeptic cases, or with purgatives, to obviate flatulence and griping. In India these seeds are highly prized as an agreeable condiment, and their use as such is so universal, that they are now regarded as a necessary of life by most of the natives of Asia.

There are two tinctures of cardamoms in the British pharmacopœia, viz. a simple and a compound tincture; the first named, *Tinctura Cardamomi*, prepared by digesting for eight days three ounces of the bruised seeds in two pints of proof spirit. It possesses all the virtues of the seeds, and may be given in doses of one drachm to three. The other, named *Tinctura Cardamomi composita*, (formerly called *Tinctura stomachica*,) prepared by digesting for fourteen days two drachms of the cardamom seeds, two drachms of carraway seeds, two drachms of cochineal, half an ounce of cinnamon, and four ounces of stoned raisins, in two pints of proof spirit. It would be an improvement in this preparation, as Dr. R. Pearson justly observes, if the proportion of cardamom seeds were increased, if the cochineal were omitted, and if, instead of four ounces of raisins, one ounce of pulverized sugar-candy were to be added, after the digestion is over. The usual dose is from two drachms to half an ounce, or more. Both these tinctures are often ordered in stomachic infusions, and joined with ether, opium, and other antispasmodics, in flatulent cholic, and in gouty and spasmodic affections of the stomach. "Among all the aromatics," says Dr. Parr, "there are none that answer so well, in general, as this simple tincture, for rendering mineral waters and other saline solutions easy and agreeable to the stomach."

Dose.—The dose in powder is from grs. v. to ℈i.



Amomum Grana Paradisi

AMOMUM GRANA PARADISI.—*Grains of Paradise Amomum.*

Class I. MONANDRIA.—*Order* I. MONOGYNIA.
Nat. Ord. SCITAMINEÆ, *Lin.*, *Brown*, *&c.* CANNÆ, *Juss.* SCITAMINÆ, ZINGIBERACEÆ, *Burn.*

GEN. CHAR. *Anther* of two distinct lobes, attached by the back, below the summit. *Filament* with a 3-lobed crest, above the anther. *Capsule* 3-celled. *Seeds* tunicated.

SPEC. CHAR. *Stalk* simple. *Bracteas* numerous, closely imbricated. *Leaves* crowded, ovate-lanceolate. *Capsule* oblong, bluntly triangular, minutely hipsid.

Syn.—Granum Paradisi officinale, *Bauh. Pin.* 413; *Dale Pharmac.* 277.
Amomum Grana Paradisi. *Lin. Sp. Pl.* 2; *Ait.* 3; *Berg. Mat Med. v.* 1. 3.

THIS species of Amomum, the fruit of which is well known under the name of Grains of Paradise, or Mellegetta Pepper, is a native of Guinea, about Sierra Leone, from whence the seeds were brought very soon after the discovery of that country by European navigators. The root is perennial, creeping horizontally. Stems erect, simple, slender, three feet high, leafy, but destitute of flowers. Leaves numerous, crowded, alternate, a span long, entire, smooth, lanceolate or slightly ovate, with a long taper point. Footstalks sheathing, linear, very long, smooth, and striated. Flower-stalks radical, solitary, an inch or two in length, ascending, clothed with numerous close sheathing bracteas; the lower ones very short; the upper gradually much larger. Of the parts of the flower we have no satisfactory account Capsules an inch and a half long, oblong, bluntly triangular, rough, with minute

hairs. Seeds numerous, roundish, of a shining golden brown colour.

The old authors confounded this species with the Cardamomum *majus*, figured in Camerarius's Epitome 11. f. 1, which is the Amomum *augustifolium* of Sonnerat, Voyage aux Indes, v. 2. 242, found in marshy ground in Madagascar. The habit of this plant is not very unlike what we have described, but the capsule is ovate, flattened on one side, and nearly twice the size of the above; and the seeds have none of that extremely hot acrid taste for which the Grains of Paradise are remarkable.

Uses.—These seeds are much less aromatic and grateful than the lesser cardamom seeds; and the taste is extremely hot and acrid, approaching in this respect to pepper, with which they agree also in their medicinal properties.

Pl. 107.



Curcuma Zedoaria.

Walker del. et lith.

CURCUMA ZEDOARIA.

Zedoary.

Class I. MONANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. SCITAMINEÆ, *Lin. Roscoe. Brown* &c. CANNÆ, *Juss* SCITAMINÆ ZINGIBERACEÆ, *Burn.*

GEN. CHAR. *Anther* double, embracing the style, 2-spurred. *Filament* petal-like, central lobe bearing the anther. *Capsule* 3-celled. *Seeds* numerous.

SPEC. CHAR. *Leaves* broad, lanceolate, smooth, with a purple cloud down the middle. *Spikes* lateral. *Bracteas* emarginate.

Syn.—Kua *Rheede Hort. Malab. v.* 11. *t.* 7.
Zerumb. *Rumph. Amb. v.* 5. *t.* 6.
Amomum Zerumbet, *Konigin Retz. Obs.* 3. 55.
Curcuma Zerumbet. *Roxb. in Asiat. Res. v.* 11. 333. & *Flor. Ind.* p. 20.
Curcuma Zedoaria, *Bot. Mag. v.* 37. *t.* 1546.
Amomum Zedoaria, *Sp. Pl. Willd. v.* 1. 7.

FOREIGN.—*Zedoire*, Fr.; *Zedoaria*, It.; *Zedoar wurzel*, Ger.; *Catchu, Cachura, Cachoramu*, &c. of the Hind. and Teling.; *Sat'hi* or *Sote*, Beng.

THIS plant is a perennial, growing in sandy open places in various parts of India, particularly in Ceylon and Malabar; flowering during the hot season. The rhizoma is tuberous, oblong, about the thickness of a man's thumb, fleshy, aromatic, and of a pale straw colour. The leaves are radical, as it is only the sheaths that create the appearance of a short stem; they are broad, lanceolate, inequilateral, smooth on both sides, of a green colour, with a ferruginous or purple cloud down the middle on the upper surface, and a fainter cloud in each side of the mid-rib below. They are bifarious and herbaceous, making their appearance with the first

showers of April or May, and perish about the beginning of the cool season in November. The inflorescence is a simple erect scape, which rises from among the leaves, and is terminated by a loosely imbricate, cylindrical, truncated, lateral spike of flowers. The outer limb of the corolla is straw-coloured; the lip ovate, emarginate, yellow towards the apex. The filament is petal-like, 3-lobed, bearing the anther in the middle. The anthers are double; the lobes separated by a deep groove, through which the style passes; the lower end of each lobe ending in a large conspicuous spur, which is the essential character of the genus. The germen is superior and 3-celled; style filiform; stigma somewhat bilabiate. The capsule is ovate, smooth, of a pale straw-colour, thin and nearly pellucid, 3-celled; seeds several in each cell. Fig. (*a* and *b*) represent the flower; (*c*) the root.

The pale colour of the roots, crimson bracteas, and ferruginous mark down the centre of the leaves, which is a constant character in this elegant species, readily distinguish it from every other.

Qualities and Chemical Properties.—The root is brought over in oblong pieces, about the size of the little finger; or in roundish ones about an inch in diameter; of an ash colour on the outside, and white within. They vary little in power, and are therefore used indiscriminately. Zedoary has an agreeable camphoraceous smell, and a bitter aromatic taste. It impregnates water with its smell, a slight bitterness, a considerable warmth and pungency, and a yellowish-brown colour. It imparts more bitterness, but less odour to spirit. It yields in distillation with water, a ponderous, and pungent essential oil; and the decoction thus deprived of the aromatic matter, and concentrated by inspissation, is disagreeably bitter and subacrid.

Medical Properties and Uses.—"This root is a very useful aromatic and stomachic. It was formerly much celebrated for colic, in hysteric affections, when attended by flatulency, and in scurvy; and, as its virtues depend principally on its camphoraceous volatile oil, we see no reason for so readily discarding it from the materia medica, as some authors recommend."

Dr. Ainslie informs us, that the best comes from Ceylon, where it is used as a tonic and carminative. It is evidently the *zerum-*

bet of Serapion, and *zerumbad* of Avicenna, who extols it highly: "Discutit flatus, cor recreat, vomitionem compescit ad venenatarum bestiolarum morsus efficax est."—*Canon. Med. lib. ii. tract.* ii. p. 11. The modern Arabs consider it to be tonic, deobstruent, and aphrodisiac. Its spirituous extract once made an ingredient in the cordial confection of the London Pharmacopœia; but an infusion is the form generally prescribed.

Dose.—In substance, gr. x. to ʒss.

CURCUMA LONGA.—*Turmeric, or Indian Saffron.*

Spec. Char. *Leaves* ovate-lanceolate. *Bracteas* spatulate.

Syn.—Amomum Curcuma, *Jacquin, Hort. Vind.* 3. *t.* 4.
Curcuma, *Rumph. Amb.* 5. 162. *t.* 67.
Curcuma longa, *Rosc.* 3; *Sp. Pl. Willd.* 2.

The root of this plant, which has been admitted into the Dublin Pharmacopœia, and is used by the dyers to give a yellow colour, is a native of the East Indies, China, and Cochin-China, and is very generally cultivated over the southern parts of Asia. The root, or rather rhigoma, acccording to Louriero, is perennial, creeping, fleshy, palmate, with cylindrical branches, and covered with a pale saffron coloured bark. Stem none. Leaves broad, lanceolate, large, quite entire, smooth, annual, pale green, densely furrowed with oblique slender lines; petioles long, erect, dilated at their base, minutely supporting and clasping each other. Scape external, three inches long. Flowers sessile, white, with a yellow nectary, one within each scale of the spike.

It is brought chiefly from the East Indies; but is commo; in the gardens of the Chinese, who use it as a sternutatory, and it grows abundantly in Malacca, Java, and Balega. In England it was first cultivated by Miller in 1759. The dried root is externally greyish, and internally of a bright yellow or saffron colour;

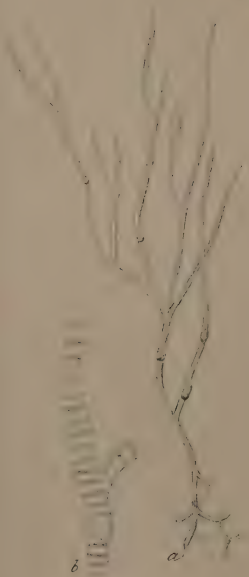
is very hard, and somewhat resembles ginger in figure and size. It should be chosen large, fresh, resinous, hard to break, and heavy.

Qualities and Chemical Properties.—Turmeric has a slightly aromatic odour, and a bitterish somewhat acrid taste. It readily gives out its active matter, both to aqueous and spirituous menstrua, communicating to the former a deep yellow, and to the latter a fine yellowish-red tint. Distilled with water it yields a small quantity of a gold-coloured essential oil. The alcoholic extract is moderately warm, nauseous, and bitter.

Medical Properties and Uses.—The medical virtues of turmeric are those of a slight stimulant and tonic. In Eastern countries this root, besides its use in colouring food, is considered as cordial and stomachic, and is accounted one of the most effectual remedies in mysenteric obstructions, uterine disorders, and affections of the kidnies and urinary passages. It is a constant ingredient in curries,* and is prescribed by the Tamool doctors, in those watery diarrhœas which are so troublesome and difficult to subdue in weak habits. Although the use of this root has been celebrated formerly as a powerful remedy in dropsies, intermittent fevers, and as a specific in the jaundice, it is now very rarely prescribed. It tinges the urine of a deep yellow, after being taken for a short time. The *dose* in substance is from ʒß to ʒij: in infusion, made with ℥ß of the root in a pint of water, two or three tablespoonsful, three times a day.

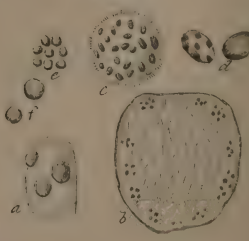
* Curry Powder.—The following receipt for curry powder is taken from the "Cook's Oracle." The ingredients are the same as those used in India, with this difference only, that some of them are in a raw green state, and are mashed together, and afterwards dried and powdered:—Turmeric, three ounces. Coriander seeds, three ounces. Black pepper, mustard, and ginger, one ounce of each. Lesser cardamoms, half an ounce. Cayenne pepper, cummin seeds, a quarter of an ounce of each. Thoroughly pound and mix together, and keep them in a well-stopped bottle.

Fucus









Helminthocorton vesiculosus

FUCUS VESICULOSUS.

Bladder Fucus. Bladder-wrack.

Class XXIV. Cryptogamia. *Order* III. Algæ.

Nat. Ord. Algæ. *Lin. Juss. &c.* Algæ, Fucales, Fucaceæ, *Burn.*

Ess. Char. *Spores* produced in clustered tubercles, which burst at their summits.

Spec. Char. *Frond* coriaceous, flat, linear, dichotomous, entire, with a central rib; vesicles innate in pairs, receptacles distinct, terminal, turgid, mostly elliptical.

Syn.—Fucus sive Alga marina latifolia vulgatissima, *Raii Syn. p.* 40. *n.* 4.
Alga sive fucus, Quercus marina dictus, *Baxter, Op. Subs.* 2 *p.* 4. 116. *t.* 11. *f.*2.
Quercus Marina, *Gmel. Hist. Fuc. p.* 60.
Fucus vesiculosus, *Lin. Sp. Pl. v.* 2. *p.* 1626; *Eng. Bot. v.* 15. *t.* 1066; *Wither. Bot. Arr. v.* 4. *p.* 84; *Esper Icon. Fuc.* 1. *p.* 33. *t.* 12; *Fl. Fr. ed.* 2 *da.* 2. *p.* 18; *Turner Hist. Fuc. v.* 2. p. 44. *t.* 88; *Hook Scot. p.* 95.

β. *spiralis*; frond twisted in a spiral manner, vesicles none, receptacles roundish. F. *spiralis*, Lin.; *Eng. Bot. t.* 1685.

γ. *volubilis*; frond spirally twisted; vesicles generally wanting; apices long, elliptical. *Raii Syn.* 42. *n.* 6.

δ. *auctus*; frond narrow, producing vesicles; apices long, lanceolate, F. *spiralis*, Esp.

ε. *angustifolius*; frond narrow; vesicles mostly wanting; receptacles sub-pedunculated, long, between linear and lanceolate, acuminated. F. *longifructus*, *Fl. Fran. ed.* 2 *da.* 2 *p.* 19.

ζ. *Sherardi*; frond narrow, dwarfish; vesicles none; receptacles short, oblong. F. *Sherardi, Stackh. Ner. Brit. p.* 72. *t.* 13.

η. *linearis*; frond narrow, dwarfish; vesicles none; receptacles long, between linear and lanceolate. F. *Quercus Marina, Gmel. Hist. Fuc. p.* 2.

Under the term Fuci are comprehended a tribe of plants, commonly included with the Ulvæ and marine Confervæ, under the more general tide of submerged Algæ, or Thalassiophyta, and well known in this country by the popular name of Sea-weeds.

In Scotland the name Wrack, (probably from the French *varec*,) is often applied to those fuci, which are cut on the shores for the manufacture of kelp. In the Linnean system, the fuci form part of the third order Algæ, of the last class Cryptogamia. The word fucus, (φυκος,) which signifies paint, has been supposed to allude to the quality possessed by some of the small reddish species, of affording a sort of rouge. They are marine plants, either floating freely in the water, and destitute of roots, or attached by a fibrous or scutate base. Their texture is fibrous, mostly coriaceous, sometimes gelatinous or membranaceous; often branched or shrub-like, and traversed with a longitudinal nerve or midrib. They produce seeds or sporules, either immersed in the frond, or in capsules or tubercles, variously situated; and many of them are furnished with air vesicles.

The economical uses of sea-weeds are numerous and important. To the agriculturist they furnish a valuable manure. To the glass-maker and soap-boiler they yield the fixed alkali, and the manufacture of kelp for this purpose became a valuable source of revenue to the proprietors of the rocky shores of Europe, particularly of Britain, and more especially of those of the Northern and Western Islands of Scotland, during the late war. From the ashes of the fuci the chemist has derived the very curious elementary substance named *Iodine*. Several of them are so rich in saccharine matter and vegetable mucilage, that on the shores of the northern countries of Europe, and the Scottish islands, much of the winter provender of cattle is derived from them. A few of them also afford food to man; some of the smaller sorts are used as condiments; while others are employed as medicines.

The Fucus *vesiculosus* is a perennial plant, growing everywhere on the British shores, on rocks and stones, or cast up on the beach; bearing its fructification in the spring. The root is an expanded, black, woody, callous disc. The frond is smooth and glossy, flat, winged, from one to four feet long, and from half an inch to an inch and half wide, linear, forked near the root, and afterwards repeatedly dichotomous, of a dark olive-green colour, becoming paler near the apices, and when dry black and

dull. All the branches are nearly of equal height, with the apices rounded, and not unfrequently notched; the margins entire. The substance of the frond is coriaceous, flexible and tough, but brittle after it is dried; and through its whole length furnished with a midrib of a blackish colour, and as thick as a goose-quill, but gradually growing pale and thin. In the membranous part of the frond throughout its whole length are found immersed spherical vesicles, varying in size from a pea to a hazel-nut, externally smooth, and containing in their cavity a quantity of air. Besides these, particularly in the spring, almost always near the apices, are often observable elliptical swellings of a pale yellowish green colour, an inch or two in length, and sometimes occupying the midrib, so that the whole becomes inflated and nearly cylindrical. The fructification consists of compressed, turgid receptacles, solitary or twin, placed at the ends of the branches, varying in form, but mostly elliptical, from one-fourth of an inch to two inches long, and perforated with very minute pores, under which lie imbedded spherical tubercles, composed of short jointed fibres, mixed with seeds of an elliptical form, surrounded with a pellucid limbus, and appearing under a powerful microscope to contain six or seven roundish grains: the centre of the receptacle is filled with a colourless and tasteless mucus, through which passes a network of anastomosing fibres. The varieties α. β. γ. and δ. are found upon the shores of the British isles, and of all the north of Europe, plentifully.—Fig. (*a*) part of the outside of a receptacle magnified; (*b*) horizontal section of a receptacle; (*c*) tubercle; (*d*) spores; (*e*) contents of a spore; (*f*) some of the same; (*g*) longitudinal section of a vesicle.

In Scotland this is sometimes called *Black Tang;* sometimes *Kelp-ware*, and when the receptacles are large and swollen, *Strawberry-ware.* The Norwegians call it *Kue-tang.* It is the Quercus marina or *Sea Oak* of the older writers.

Qualities and Chemical Properties. — The most important uses to which Fucus *vesiculosus* is applied is in the manufacture of *Kelp*, which is a very impure carbonate of soda, containing sulphate and chloride of sodium, with a portion

of charcoal; and is manufactured in Scotland chiefly in the months of July and August. The kiln in which it is made is a round pit or basin dug in the sand or earth on the beach, and surrounded with a few loose stones. In the morning a fire is kindled in the pit, generally by means of peat or turf. This fire is generally fed with sea-weed, in such a state of dryness that it will merely burn. In the course of eight or ten hours the furnace is found to be nearly full of melted matter. Iron rakes are then drawn rapidly backward and forward through the mass in the furnace in order to *compact* it, or bring it into an equal state of fusion. It is then allowed to cool, when it is broken into pieces, and carried into a storehouse, to remain till shipped.

The fuci, which are chiefly used on our shores are the Fucus *vesiculosus*, *nodosus*, and *serratus*. In some places, F. *loreus* and *filum* are employed, but not to any extent. By means of a boat and long sharp hooks, F. *digitatus* is cut in some places, and this species, together with F. *saccharinus*, *bulbosus*, and *esculentus*, form much of the drift-ware employed in making kelp. Some of them are no doubt richer than others in alkali, but when fit for burning they are all capable of yielding about one-fifth of their weight in kelp.

Iodine, as already hinted, is also yielded by kelp. Its name being derived from ιωδης, *violaceus*, in allusion to the very striking circumstance of its yielding a violet-coloured gas on being exposed to an increase of temperature. It was first discovered accidentally by M. Courtois, of Paris, and its properties have been since accurately examined by Clement and Desormes, Gay Lussac, Sir H. Davy, Vauquelin, and Wollaston. The latter was the first who gave a regular formula for extracting it; he dissolved the soluble part of kelp in water, and after evaporating it as long as it continued to afford crystals, he added a little more sulphuric acid to the remaining liquid than was necessary to neutralize the free soda which it contained, and after all action had ceased, he added as much black oxide of manganese to the clear liquor which remained, and on the application of heat, iodine was disengaged. The soap

manufacturers obtain their principal supply of soda from kelp; and Dr. Ure found, that a very large quantity of iodine may be obtained from the brown oily liquid which remains after most of the soda has been abstracted from the kelp-ley. A basin is filled about one-half with this liquid, after it has been heated to 230, and for every eight ounces about one ounce of sulphuric acid is added, previously diluted with its own bulk of water; a violent effervescence immediately ensues; sulphur is deposited, while sulphureted hydrogen, sulphurous, carbonic, and muriatic acids are disengaged; and on cooling, crystals are deposited, consisting principally of sulphate of soda. The liquid is filtered, put into a glass retort, and to every twelve ounces, one thousand grains of the black oxide of manganese are to be added; heat is now to be applied, and the iodine rises in a rich purple vapour, which condenses in crystalline plates. It is collected by adapting a receiver to the retort, from which it is easily withdrawn by a little water.

Iodine is a solid substance of a bluish-black colour and metallic lustre. It is soft and friable, andis obtained generally in the form of small scales, sometimes in rhomboidal plates, and even in elongated octohedrons; it does not conduct electricity. It has a pungent odour, an acrid taste, and stains the skin of a deep brownish-yellow colour; when taken in considerable quantity, it acts as a strong poison. It evaporates at the ordinary temperature of the atmosphere, melts at 227, and is sublimed at 350. When mixed with water it passes to the gaseous state along with its vapour at a boiling temperature. It is soluble in alcohol and ether, but sparingly so in water; its solutions have an orange-brown tint, destroying the vegetable colours. *Starch* is the most delicate test of iodine, forming a compound of a very rich blue colour, when added to any solution which contains it in an uncombined state. In its general properties it bears a great analogy to chlorine, and like it, is always attracted to the positive pole of the galvanic battery, when disengaged from its combinations with the metals or other inflammable bodies. The specific gravity of iodine is 4.941, and that of its vapour 8.678, 100 cubic inches weighing about 270 grains.

Iodine is considered by the most eminent chemists to be a simple body. It forms with oxygen the *iodic acid*, and with chlorine the *chloriodic acid*. *Iodates* are prepared either by the direct addition of iodic acid to salifiable bases, or by the action of iodine on these substances in water. Thus the iodate of potash is obtained by pouring a solution of potash on a fixed quantity of iodine, till it loses colour. In this process part of the water is decomposed; its hydrogen combines with one portion of iodine, and forms hydriodic acid, while oxygen at the same time unites with another portion, and forms iodic acid; these two acids combine with the potash, and we thus obtain a mixed solution of *iodate* and *hydriodate of potash*. This solution is then evaporated to dryness and digested in alcohol, which dissolves the *hydriodate*, and leaves the *iodate*, which is insoluble in alcohol. The supernatant liquor being poured off and evaporated, the *hydriodate* is obtained, as it is very soluble in water.

Medical Properties and economical Uses. — The F. *vesiculosus* is well known as an excellent manure for land, to which purpose it is often applied in the maritime parts of Scotland and other countries. In the islands of Jura and Skye it serves as a winter food for cattle, which regularly come down to the shores at the recess of the tides to seek for it. Linneus informs us that the inhabitants of Gothland boil it in water, and mixing a little coarse meal or flour, feed their hogs with it; for which reason they call the plant *swine-tang*. And in Scania, he says, the poor people cover their cottages with it, and sometimes use it for fuel.

Its medical virtues have been much celebrated by Dr. Russell in his Dissertation concerning the uses of Sea-water in the Diseases of the Glands. He found the saponaceous liquor or mucus in the vesicles of the plant to be an excellent resolvent, and useful in dispersing scrofulous swellings. He recommends the patient to rub the tumour with these vesicles bruised in the hand, and afterwards to wash the part with sea-water. But the most beneficial use to which the F. *vesiculosus* is applied is in making kelp, already mentioned: a work much practised in the Western Islands.

Dr. Coindet, of Geneva, suspecting from analogy that *iodine*

was the active principle in sponge, was induced to try it in those cases for which burnt sponge was administered, and his success in the treatment of bronchocele was very remarkable. It has been used by many practitioners both on the continent and in our own country, with undiminished reputation. Success is most commonly to be expected in recent cases, and when the patient is young; several instances have, however, occurred, in which old, hard, and very large goîtres have yielded to this remedy; but in such instances as the course of treatment is protracted, it may have injurious effects on the stomach; to obviate which it has been the object to introduce the remedy by means of friction; and a case is recorded by Mr. Rickwood, where a patient was cured at the age of seventy years. Iodine has been likewise employed in the treatment of scrofula with equal success; and in the hands of M. M. Hufeland and Osan, the efficacy of the tincture of iodine, and hydriodate of potass have been fully proved; they have also employed the same preparations with advantage in scirrhus and cancer of the uterus. Dr. Wagner speaks of its beneficial influence on a tumour situated in the neighbourhood of the jaw, which he considered cancerous; and Dr. Hannemann is satisfied that iodine exerted a remarkable influence on cancer of the uterus in the most advanced stage.

There seems to be no reason for doubting that this new remedy exerts a very marked influence over scrofulous and adventitious deposits. We have therefore numerous and well-attested cases of its successful employment in an immense number of diseases, such as white-swelling, deafness, paralysis, distortion of the spine, &c. Professor Maunoir states, that a child laboured under a considerable white swelling of the knee, and could not walk without crutches. The usual modes of treatment proving unavailing, the tumour was rubbed night and morning with iodine ointment, while the tincture was given internally in small doses. After a few weeks a perfect cure took place.

If iodine be taken in doses too large, or be not properly watched as to its effects, it is apt to produce inflammation of the stomach, attended by nausea, incessant vomiting, and general emaciation; while the testes and mammæ diminish in a remark-

able manner. These facts, however important to be known, do not in the least militate against the judicious employment of a remedy, that should be viewed as a valuable boon, by every scientific physician; for we have the names of Dr. Gardner, Dr. De Carro, Dr. Roots, Dr. Baron, Mr. Austin, and many other eminent practitioners, especially Lugol, who, closely watching its effects, in well-regulated doses, consider it as a remedy easily to be managed; and in our own practice, we continually employ it with perfect satisfaction, not only as a safe, but very efficacious agent.

Dr. Baron has employed it with some success in the treatment of scrofulous phthisis, and other tuberculous affections; and the late Mr. Haden also reports a case of phthisis supposed to have been cured by iodine. Cases are also recorded of its success in ovarian dropsy. Dr. Coindet praises it as a powerful emenagogue; an opinion which has been confirmed by Professor Brera and other physicians. In fact, that gentleman has employed the remedy very extensively. Besides bronchocele, and suppressions of the catamenia, which have been cured by it, he mentions several cases of indurated glands, tabes mesenterica, chronic dysentery, and hæmoptöe, supervening to suppressed menstruation; laryngeal phthisis, leucorrhœa, syphilitic enlargements, &c. as having been also cured by it. Mr. Callaway, surgeon to Guy's Hospital, confirms its success in scrofulous cases and in enlarged mesenteric glands. M. Magendie informs us that he gave iodine in a case represented to him to be suppressed catamenia, and at the end of three weeks abortion was the result!

It will be seen from this account, that the value of iodine as a remedial agent in a vast variety of important diseases, does not rest on the testimony of one or two individuals only; but that its employment is established through the concurrent testimonies of many eminent men in different countries; and we have chosen rather to bring together *many facts*, than to speculate on its mode of action, or to recommend it for particular diseases.

Tincture of Iodine.

Take of, Alcohol at 35° 1 once.*
Iodine . . . 48 grains.—Mix.

* An *once* is 7 drachms, 52½ grains, Troy weight.

This tincture, says M. Magendie, is less frequently employed than the two following preparations. It is given in doses of from four to ten drops, three times a day, in a glass of sugared water, or infusion of liquorice; the doses may be gradually augmented to twenty drops.

Iodureted sulphuric Ether.

Take of, Sulphuric ether 1 gros.*
Pure iodine . 6 grains.—Dissolve.

Thirty drops contain one grain of iodine, and the patient can scarcely bear more than ten drops at a time.

Solution of Hydriodate of Potass.

Take of, Hydriodate of Potass 36 grains.
Distilled water . . 1 once.—Dissolve.

These two preparations, whose mode of exhibition is the same as that of the tincture of iodine, are employed, as well as it, in the treatment of bronchocele and scrophula; in the latter case some tonic is generally combined. M. Magendie states, that the solution of the hydriodate of potass may be gradually increased to three *gros* a-day, without unpleasant consequences; debilitated and very nervous women have taken it in this quantity, for many weeks, without any derangement of function: with this dose two cases of cancer of the tongue recovered in the space of a fortnight, in the incurable wards of L'Hospice de la Salt-pétrière.

Ointment of Hydriodate of Potass.

Take of, Hydriodate of potass ½ gros.
Spermaceti ointment 1½ once.—Mix.

A small piece of this ointment may be used night and morning, in the way of friction upon enlarged glands. At the end of a week it may be increased in quantity, according to the age of the patient and extent of the tumour. Sometimes, by these means, the complete resolution of tumours is effected, which could not be removed entirely by saline solutions. Occasionally it is necessary to apply leeches likewise to the indurated glands.

There are some other preparations occasionally employed, such as the iodate of zinc, iodurets of mercury, &c.; for accounts of which the curious reader may consult Houlton's Translation of "Magendie's Formulary."

* The *gros* is 59 grains.

Lugol, who has tried iodine and its various preparations more carefully and extensively than any one else, attributes many of its failures, and the whole of its reputed untoward effects, to the improper doses in which it has usually been administered; which, according to his views, are immoderately large. Lugol presented a memoir on the treatment of scrofulous and cancerous diseases by iodine to the French Academy, and the report made by Magendie, Serres, and Dumeril, was most conclusive and satisfactory. We cannot do better than conclude this notice with some extracts from it, and from this memoir.

"In the first place, (say the reporters,) we would remind our hearers that the scrofulous affections, long known under the names of cold humours, or the evil, constitute a class of those slow, unsightly, and often hereditary diseases, which strike despair into whole families, from the absolute rarity of their cure, and from the irremediable light in which they are regarded by the majority of physicians and by the hospital regulations. Hence also the afflicted patients submit themselves to the illusive practices suggested by superstition. For, though medicine has successively tried all the remedies with which she is acquainted, the number, and even the absurd variety of which attest too strongly the want of a certain method of cure, it must still be confessed that an efficacious mode of treatment remained to be made known.

"Sometimes this disease is external and visible, and shows itself under the skin by swellings which are slowly developed, become softened, burst, and remain ulcerated for a lengthened period, and thus produce callous and incurable scars; it takes its place in the substance of the integuments, which it renders deformed and disgusting; attacks the ears, the eyelids, the nostrils, and the lips, which become horridly tumid, or are corroded to such an extent as utterly to disfigure human nature.

"Sometimes, more deeply hidden, the scrofulous habit attacks the bones and their articulations, obstructs the canal which transports the lymph and chyle, or produces in the lungs, and other most important organs, tubercles, which ultimately soften and degenerate to purulent cancers, thus giving rise to serious morbid alterations in the living economy, which eventually yields to the effects of the disease.

"Such is the abridged view of this frightful malady, to which M. Lugol with zeal, perseverance, and success, has opposed a remedy not absolutely new, but which had never previously been administered with so much method and precaution, to such a number of individuals at once, or with such evident and decided effects.

"M. Lugol is one of the distinguished physicians attached to the Hopital Saint Louis, the only hospital in Paris where a great number of scrofulous patients are admitted for internal treatment. This circumstance explains how, in the short period of seventeen months, from the 10th of August, 1827, to the 31st of December, 1828, M. Lugol has been enabled to collect the detailed cases of upwards of one hundred patients; in whom he, of course, found great variety in the seat and intensity of the disorder.

"Before your commissioners proceed to give an analysis of the memoir, they deem it right to declare, that they have not at all confined themselves to the scrutiny of its contents; but that they have seen, examined, and questioned the patients under treatment; and have also visited some of those reported cured or convalescent; that all the author's assertions have

been found scrupulously exact; that many of the patients who were under treatment when the memoir was finished, have since been completely cured.

"Without restricting ourselves to the order followed by M. Lugol in his treatise, we proceed to make known the principal results.

"In the first place, we may observe, that he uses two preparations of iodine: the one exclusively intended for internal administration is a solution of this simple substance in distilled water; the others are proper for external application, whether as ointments for ulcers, pomades for frictions, or watery solutions of varied strength, for collyria, lotions, and injections.

"The motives which have induced M. Lugol to employ by preference the aqueous solution of iodine, appear exceedingly plausible. So active a medicine can scarcely be administered in an hospital without inconvenience and uncertainty, except in the form of a drink. The alcoholic tincture and syrup of iodine present many disadvantages in the exact measurement and distribution of their doses, while a pint, or half a pint of distilled water, containing in solution a little common salt, and a fixed quantity of iodine, affords an easy, precise, and economical method of dispensing the remedy. Two degrees of this solution intended for the patients, and designated by the name of mineral water, Nos. 1 and 2, (the first containing two-thirds of a grain, and the second one grain of iodine in solution,) have furnished the means of dosing exactly from day to day, and of recognizing the effects of what was previously employed: thus, half of No. 2 is the first allowance, the entire of No. 1 the second, and, finally, the whole of No. 2.

"As to the preparations intended for external treatment: these are unctuous substances of a certain weight, and associated in determined and successively increasing proportions with iodine, ioduret of potassium, (hydriodate of potash,) or with the proto-ioduret of mercury.

"These simple means have sufficed Mr. Lugol for the treatment and cure of numerous cases, twelve of which, selected from the different species of scrofulous affections, are described in the memoir. Three relate to ulcerated tubercles, cured in three, seven, and twelve months. Two cases are also described of ophthalmia and coryza, one of which yielded to a treatment of forty-six days, whilst the other was prolonged to the ninth month. A case of fistulous abscess, deeply situated in the cellular tissue, has required nearly a year's cure. Some cases are also recorded by M. Lugol, of that frightful form of the disease most usually denominated 'dartre rougeante,' but which the author names the Esthiomenic, (or corrosive) scrofula. Finally, a case of scrofulous caries is detailed: this last form has generally been found very intractable. M. Lugol is only able to advance this single case of cure. It will be remarked also, that the proto-ioduret of mercury was used, and that there still remains a small fistula as yet unhealed, but which appears to have a tendency to cicatrization."

The cases referred to in the report are too numerous and too long for extract, although we had marked many for transference to our pages; but they are so interesting and convincing, that we recommend them to our readers' perusal: suffice it for us to make known the general results, and we fully agree with the author, that "the importance of the facts related is great, for they contain proofs that iodine, properly admini-

stered, is not followed by any outward effects of emaciation, &c., as when improperly employed; and that numerous cases of severe scrofula have been entirely cured, and others greatly relieved, to part of which he refers in the following summary: "Eugene Chateau, Francis Poriè, Claude Michelot, Marguerite Binger, are among the first scrofulous cases I treated. I did not place them under the same head, on account of the cruelty of informing them that no hope was entertained of their cure.

"Richard, affected with a disease which had mowed down eight of her brothers and sisters, and who saw before her, in sad perspective, a scrofulous sister two years older than herself, and labouring under thoracic disease, with tubercles in her lungs.

"Adele Gandil, the offspring of a tubercular mother, and herself affected since the age of ten with scrofula in its worst form.

"Amand Olivier, under similar hereditary circumstances to Gandil, labouring under four fistulæ in the most dangerous vicinities, and which entitled us to apprehend the worst from the state of etiolation, debility, and emaciation, into which profuse suppuration of four years had thrown the unhappy patient.

"These facts, and a still greater number yet remaining to be described, place iodine in the rank of the most active and efficacious remedies which the art of healing possesses; its introduction into medicine should therefore be considered as one of the most precious improvements in that science. We have before our eyes patients attacked with scrofulous lesions, usually productive of a state of marasmus and colliquation, and which, under the influence of iodine, energetically resist the inroads of the disease. In some even of this description, a marked tendency to cure is observable, too weak or too transitory, it is true, to prevent the encouragement of rational hope.

"Under this head are particularly placed cases of caries and of certain tubercular tumours of great magnitude, and which could be expected to yield but tediously to the influence of curative means.

"In the earlier cases M. Lugol used an aqueous solution of iodine for internal administration; this he has subsequently changed for a combination of iodine with hydriodate of potash; it may, however, be the most advantageous plan to afford our readers a view of both the earlier and later formulæ.

Iodurетted Ointment.

		Old.	No. 1. New.	No. 2.	No. 3.
℞	Fresh lard	lbij	ʒij	lbij	lbij
	Hydriodate of potash	ʒiv	ϑiv	ʒv.	ʒv
	Iodine - -	ϑiv	grxij	ϑxiv	ϑxvi

"Afterwards," says M. Lugol, "I made use of a solution of iodine, which occasionally forms a valuable substitute for the preceding ointment, especially in scrofulous ophthalmia, and for the injection of fistulous canals.

Iodurетted Solution.

For external use.

		No. 1.	No. 2.	No. 3.
℞	Iodine	grij	griij	griv
	Distilled water	lbj	lbij	lbiij

The above solutions the author has now abandoned for the following, which he finds the most certain and least inconvenient method of prescribing iodine for internal use.

Iodurетted Mineral Water.

		No. 1.	No. 2.	No. 3.
℞	Iodine	gr$\frac{3}{4}$	grj	grj$\frac{1}{4}$
	Hydriodate of potash	gri$\frac{1}{2}$	grij	grij$\frac{1}{2}$
	Distilled water	℥viij	℥viij	℥viij

"I commence (he continues) the internal treatment with half a grain of iodine; for this proportion I prescribe two-thirds of the mineral water, No. 1. In the second fortnight I gave the entire of this number; that is, three-fourths of a grain daily, varying the dose within narrow limits according to the peculiarities of the case.

"During the fourth fortnight, or in the beginning of the fifth, I give a grain daily, and usually I continue this quantity to the end of the treatment. In some cases I have prescribed a grain and a quarter; still more rarely I have increased the dose to a grain and a half, but I have never gone beyond this quantity daily.

"Another advantageous form of preparing this mineral water on a larger scale, is by first making a concentrated solution of iodine in hydriodate of potash, and then diluting it with a sufficient proportion of water; thus,—

℞	Iodine	℈i
	Hydriodate of potash	℈ii
	Distilled water	℥vij

This solution contains one twenty-fourth of iodine poured; into sixteen pounds of distilled water, it forms thirty-two bottles of eight ounces of the mineral water, No. 1. It is easy to understand that by diminishing the distilled water one fourth, we compose No. 2, and by using three-fifths of water, we obtain No. 3.

"Again, the concentrated solution now used serves for the administration of the remedy in drops once or twice daily, a mode of prescribing I frequently follow in my private practice. I commence with six drops given in the morning fasting, and six in the afternoon, an hour before dinner, in a glass of water flavoured with sugar. Every week the daily dose is increased by two drops, until it shall have reached thirty, or even thirty-six drops daily.

"For children under seven years old I would recommend two drops twice daily for the commencement, to be increased gradually to five drops twice a day, morning and evening.

"From seven to fourteen years I seldom order more than sixteen drops daily. I deem it imprudent to exceed that quantity. (p. 166.)

"Ointment of the proto-ioduret of Mercury. The following formulæ expresses the quantities of the ingredients in the several strengths of the ointment which I am in the habit of prescribing.

℞	Proto-ioduret of mercury	℈ij	℈iij	℈iv
	Fresh lard	℥ij	℥ij	℥ij

" In my first memoir I only mentioned one solution intended for external use, but similar reasons to those which induced me to change the formula for internal doses, have led to the use of the subjoined solutions, which are at the same time more permanent in their constitution, and uniform in their effects.

		No. 1.	No. 2.	No. 3.
℞	Iodine - -	grij	griij	griv
	Hydriodate of potash	griv	grvi	grviij
	Distilled water -	lbj	lbj	lbj

" Injections may be made on the conjunctiva and the lachrymal passages with the solution; also in cases of coryza and ozœna it should be used several times a-day, and is best applied by means of a syringe. In injections of the nasal fossæ, care should be taken not to direct too much of the solution towards the internal fauces.

Rubefacient Solution of Iodine.

℞	Iodine -	ʒiv
	Hydriodate of potash	℥i
	Distilled water -	℥vi

" The above solution should be kept in a bottle with a glass stopper, as it rapidly corrodes corks.

" This solution is very useful in cases where scrofulous surfaces require stronger excitement than usual: for example, to the eyelids and angles of the eyes in obstinate chronic ophthalmia, in coryza and other forms of scrofulous disease in the nasal fossæ. It is most conveniently applied by means of pledgets of fine lint. Even after a cure, I have frequently applied this solution to the deformed cicatrices characteristic of this disease; and it usually renders them smoother and less prominent and livid.

" The rubefacient solution may also serve two other important purposes, viz. the preparation of local baths and iodurettted poultices."

The iodurettted baths have been found singularly serviceable by M. Lugot, and he warmly recommends them to be used in the treatment of many cases. He finds that wooden vessels are the best for containing the water impregnated with iodine; and Dr. O'Shaugnessy, in his translation of the original work, has given a very convenient table indicating the proportions of the several ingredients.

Dr. A. T. Thompson has lately published an account of the medicinal effects of two new preparations of iodine, viz. the ioduret and the hydriodate of iron. These have not as yet been very extensively administered; but the reports of their beneficial effects in strumous diseases, and even in carcinoma are most encouraging.

FUCUS (*vel* GIGARTINA.) HEMINTHOCORTON.

Corsican Worm-moss.

SPEC. CHAR.—*Fronds* cartilaginous, cylindrical, capillary, growing in matted tufts, jointed, irregularly dichotomous; apices acuminate. *Capsules* hemispherical, scattered, lateral, sessile.

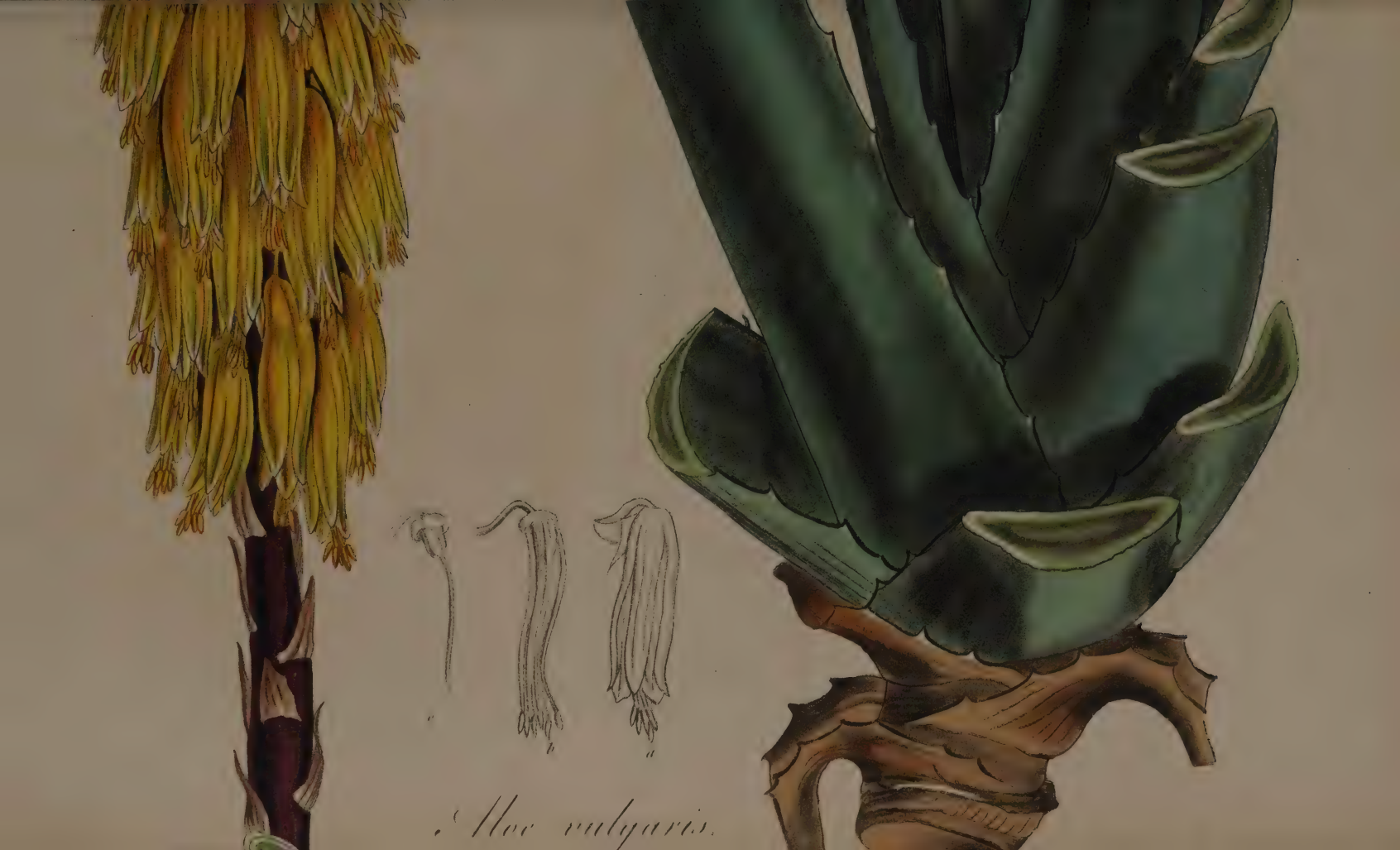
Syn.—Conferva Helminthocorton, *Lin. Syst. Nat. Gmel. v. 2. p.* 1394.
Fucus Helminthocortos, "*Hæmmerten, Dis. cum icone*" *teste Rothio Fl. Fr. ed. 2da* ii. *p.* 37.
Ceramium Helminthocortos, *Roth Cat. Bot.* ii. *p.* 168. iii. *p.* 157.

THIS small species is found growing in the Mediterranean sea, on the coast of Corsica, attached to calcareous rocks and other marine bodies. The root is wholly composed of creeping fibres, variously branched and thickly interwoven. The fronds are very numerous, from the same base, clustered into compact, cushion-like tufts, some inches in width, an inch or an inch and half long, erect, straight, or slightly flexuose cylindrical, not thicker than hog's bristles, once or twice irregularly dichotomous at short intervals, with erecto-patent segments of nearly equal height, all remarkably acuminated. The fructification consists, according to Dr. Roth, of small, hemispherical capsules, sessile upon the sides of the branches, solitary, generally few in number and remote from each other; when young, composed of a very thin membrane, white and pellucid; when old, their surface becomes unequal as if tubercled, and in the midst is discernible a small membranaceous pellucid vesicle: colour, light reddish-brown, semi-transparent, turning white if long kept in fresh water, and darker when dried: substance, cartilaginous, inclining to horny, tough, and flexible. On the plate (No. 108) we have given a tuft of F. *Heminthocorton* of the natural size. (*a*) A single frond magnified; (*b*) part of the same.

Medical Properties and Uses.—This plant, though almost entirely unknown among the practitioners of this country, has long been celebrated on the continent, and is there in common use as a vermifuge, under the name of the moss or the Coralline of Corsica. It has also been recommended as a remedy in cancer!

Pl 109.





Aloe vulgaris.

ALOE VULGARIS.

Yellow-flowered Aloe.

Class VI. Hexandria. *Order* I. Monogynia.

Nat. Ord. Liliaceæ, Coronariæ, *Lin.* Asphodeli, *Juss.* Asphodeleæ, *De Cand.* Hemerocallideæ, *Brown.* Asphodelaceæ, *Burn.*

Gen. Char. *Perianth* petaloid, tubular, border spreading, 6-cleft, base nectariferous. *Filaments* exserted from the receptacle. *Capsule* superior, oblong, 3-celled. *Seeds* several, angular.

Spec. Char. *Leaves* sword-shaped, toothed, upright. *Stem* branched. *Flowers* yellow, in a dense panicle.

Syn.— Aloe, *Trag. Hist.* 932; *Fuchs. Hist. v.* 2. 160; *Matth. Valgr. v.* 2. 45, 46; *Camer. Epit.* 450.

Aloe vulgaris, *Bauh. Pin.* 286; *Tourn. Inst.* 366; *De Candolle Pl. Grasses, 27, cum icone; Ait. Hort. Kew. ed.* 2. *v.* 2. 292; *Ger. Em.* 507; *Fl. Græc. Sibth. v.* iv. *p.* 34. *t.* 341.

Aloe perfoliata π, vera, *Lin. Sp. Pl.* 458.

Aloe perfoliata λ, vera, *Willd. Sp. Pl. v.* 2. 186.

Aloe Barbadensis, *Haworth in Trans. of Lin. Soc. v.* 7. 19.

Αλοη, *Dios. lib.* 3. *cap.* 25.

The Aloe *vulgaris*, which is the species that Sloane describes in his History of Jamaica, as producing the Barbadoes extract, is a native of the Levant and Barbary. Though generally known under the name of Barbadoes Aloe, it is said not to be very common in the West Indian islands, where the plants are propagated on the poorest soil for the purpose of obtaining the Hepatic aloes of the shops. It is the αλοη of the ancient Greeks, and was found by Dr. Sibthorpe growing spontaneously in the island of Cyprus.

The stem is short, thick, shrubby, branched, and, like the rest of the plant, abounding in a clammy, bitter, fetid, yellowish

juice. The leaves are about four inches broad at their base, crowded, sessile, nearly erect, or somewhat spreading, a foot long, lanceolate, acute, fleshy, smooth, succulent, concave above, of a seagreen colour, and when young, spotted with white. The flower stem rises about three feet in height; it is round, thick, erect, smooth, of a brownish purple colour, branched at top, and terminated by the flowers which form a slender, loose spike, and are of a bright yellow colour. The flowers are numerous, spreading horizontally in an elegant spike, and stand on short, smooth footstalks, each flower being accompanied by a single bractea. The bracteas attached to the flower stems are triangular, membranaceous, and of a deep brown colour. The perianth is hexapetaloid, the pieces connate, the tube long, the limb deeply 6-cleft, cylindrical, and oblong; the outer segments are larger than the inner, ovate, blunt, and spreading at the border. The stamens are thread-shaped, as long as the corolla, or longer, exserted from the receptacle, and furnished with oblong, incumbent anthers. The germen is oblong-ovate, angular, bearing a style nearly of the length and shape of the stamens, with a small, simple stigma. This species and A. *stricta*, are the softest and most succulent of all the Aloes; the former is the only species whose flowers are yellow. Fig. (*a*) represents a flower with its bractea; (*c*) the pistil with the base of the corolla; (*b*) the same with the corolla removed.

PL. 70.



Aloe Socotrina L.

W. Hall sc.

ALOE SOCOTRINA.

Socotrine Aloe.

SPEC. CHAR. *Leaves* sword-shaped, somewhat curved at the apex, those of the stem sheathing; marginal teeth small, white, numerous. *Flowers* in spikes, drooping.

Syn—Aloe vera, *Mill. Dict. n.* 15.
Aloe rubescens, *Plante's Grasses, cum icone mala.*
Aloe Americana ananifolia floribus suave-rubentibus, *Pluk. Phyt. t.* 240.
Aloe vera minor, *Munting, Aloidar. cum icone.*
Aloe perfoliata Socotrina, *Ait. Kew.* 1. 466; *Bot. Mag. v.* 14. *t.* 472; *Stokes, v.* 2. *p.* 569.
Aloe Socotrina, *Haworth in Trans. of Lin. Soc. v.*7; *Woodv. Med. Bot. c.* 4. *ed.* 2*d. t.* 260.

FOREIGN.—*Suc d'Aloes*, Fr.; *Aloe*, It. and Sp.; *Glausinde Aloe*, Ger.; *Elwa*, Hind.

THE Socotrine Aloe is a perennial plant, with a strong fibrous root; flowering in winter and spring. The stem is round, smooth, erect, of a glaucous green colour towards the top, beset with ovate bracteal scales, and rises to the height of three or four feet. The leaves are numerous, spreading, and proceed from the upper part of the root; they are about two feet long, broad at the base, tapering gradually to a point, thick, fleshy, succulent, channelled, glaucous, smooth, and armed at the edges with remote, whitish, horny teeth. The flowers are produced in terminal spikes, of a purple or reddish colour; each flower being accompanied with a single ovate, acute, broad, membranous bracte, white, with three green streaks, and shorter than the corolla. The perianth is petaloid, bell-shaped, and divided into six narrow segments; the three inner lobes are white with three green lines; the outer ones narrower and less concave. The filaments are six, tapering, yellowish, exserted from the receptacle, and furnished with oblong, orange-coloured anthers; the

germen is oblong, with a simple slender style, and an obtuse stigma.* The capsule is oblong, 3-celled, containing many angular seeds.—Fig. (*a*) represents a flower cut open; (*b*) the germen and style.

All the species of this extensive genus are natives of hot climates, and most of them grow at the Cape of Good Hope.

It is now well known that numerous individuals of the Aloe family furnish the concrete juice, met with in commerce under the name of *aloes*; but the subject is still surrounded with so many difficulties, that we must crave the indulgence of our readers, should we be so unfortunate as to perpetuate errors, or fail to increase their present stock of knowledge. Six different kinds of aloes are met with in commerce:—

1st. *Barbadoes aloes*, also called *Hepatic aloes*, and *extract of the common aloe*, is, as stated before, the produce of the A. *vulgaris*. The following account of the culture pursued at Barbadoes, and of the method by which the juice is collected, was communicated by Mr. Millington to the Medical Journal, vol. viii.

"The lands in the vicinity of the sea, that is, from two to three miles, which are rather subject to drought than otherwise, and are so stony and shallow, as not to admit of planting sugar-canes with any prospect of success, are generally found to answer best for the aloe-plant. The stones, at least the largest ones, are first picked up, and either packed in heaps upon the most shallow, barren spots, or laid round the field as a dry wall. The land is then ploughed lightly, and very carefully cleaned of noxious weeds, lined at one foot distance from row to row, and the young plants set, like cabbages, at about five or six inches from each other. This regular mode of lining, and setting the plants, is practised by the most exact planters, in order to facilitate the weeding of them by hand very frequently, because, if they are not kept perfectly clean and free from weeds, the produce will be but very small.

"They will bear being planted in any season of the year, even in the driest, as they will live on the surface of the earth for many weeks, without a drop of rain. The most general time, however, of planting them is from April to June. In the March following, the labourers carry a parcel of tubs and jars into the field, and each takes a slip or

* The figure here represented was made from a fine specimen, which blossomed in April 1829, at Queen's Elm, Chelsea, in the hot-house of our respected friend, A. H. Haworth, Esq. F.L.S.

breadth of it, and begins by laying hold of a bunch of the blades, as much as he can conveniently grasp with one hand, while with the other he cuts it just above the surface of the earth, as quickly as possible, that the juice may not be wasted, and then places the blades in the tub, bunch by bunch, or handful by handful. When the first tub is thus packed quite full, a second is begun, each labourer having two; and by the time the second is full, all the juice is generally drained out of the blades in the first tub. The blades are then lightly taken out, and thrown over the land by way of manure, and the juice is poured out into a jar. The tub is then filled with blades, and so alternately till the labourer has produced his jar full, or about four gallons and a half, which is often done in six or seven hours, and he has then the remainder of the day to himself, it being his employer's interest to get each day's operation as quickly done as possible.

"I should observe, that although aloes are often cut in nine, ten, or twelve months after being planted, they are not in perfection till the second and third year; and that they will be productive for ten or twelve years, or even longer, if good dung, or manure of any kind, be strewed over the field once in three or four years.

"The aloe juice will keep for several weeks without injury. It is, therefore, not boiled till a sufficient quantity is procured to make it an object for the boiling house. In the large way, three boilers, either of iron or of copper, are placed to one fire, though some have but two, and the small planters only one. The boilers are filled with the juice, and as it ripens, or becomes more inspissated, by a constant but regular fire, it is ladled forward from boiler to boiler, and fresh juice is added to that farthest from the fire, till the juice in that nearest the fire (by much the smallest of the three, and commonly called by the name of *tatch* as in the manufactory of sugar) becomes of a proper consistence to be skipped or ladled out into *gourds*, or other small vessels used for its final reception. The proper time to ladle it out is when it has arrived at what is termed a resin height, or when it cuts freely, or drops in thin flakes. A little lime water is used by some aloe boilers, during the process, when the ebullition is too great. As to the sun-dried aloes, which are more approved for medicinal purposes, very little is made in Barbadoes. The process is very simple. The raw juice is either put into bladders, left quite open at the top, and suspended in the sun, or in broad shallow trays of wood, pewter, or tin, exposed also to the sun, every dry day, until all the fluid parts are exhaled, and a perfect resin formed, which is then packed up for use or for exportation."

2nd. *Socotrine aloes.*—The real Socotrine aloes, which is rarely met with in commerce, is produced by the A. *Socotrina.* It grows in abundance on the island of Zocotora, which was first discovered by the Portuguese in 1503, and now belongs to the Princess of Hadramanb, a province of Arabia, contiguous to Yemen. The plant is also found in many parts of the South of Africa, particularly in the kingdom of Melinda, where the

greater part of the extract is prepared that is now sold under the name of Socotrine, and Cape aloes. India, Borneo, and Sumatra, also furnish us with this kind of aloes, which are sometimes packed in casks, and at others in skins.

In the island of Zocotora, the inhabitants cut or chop the leaves, and make a slight pressure to obtain the juice, which is left to settle. It deposits a feculent matter, which is thrown away. The supernatant liquor thus freed from its grosser parts, is left to spontaneous evaporation; and it is this difference in the two processes that accounts for the superiority of the real Socotrine aloes over that of the Cape: for there, the Hottentots cut the end of the leaves and catch the liquor which flows from them in proper vessels, the lower leaves of the plant generally serving for canals to conduct it into them. The juice thus obtained, is at once reduced to a suitable consistence over the fire, and afterwards packed in boxes containing from one to three hundred pounds.

Socotrine aloes is in solid fragments, compact, heavy, and brittle. It is of a yellowish red or brown colour, in proportion to its purity; is glossy, and breaks with a smooth conchoidal fracture. The thin edges are reddish, and semi-transparent. It is rendered friable by cold, softens by heat, and is adhesive to the touch: it is easily reduced to a powder, which is of a golden yellow colour: but it soon condenses again into a mass, the particles of which adhere strongly. The odour is strong, *sui generis:* the inferior sorts fetid and nauseous. The taste is bitter, resembling bile. According to Bouillon La Grange, and Vogel, it is composed of 22 parts of resin, and 68 of extractive matter. It dissolves almost entirely in spirits of wine, and yields a volatile oil by distillation. It is considered to be more mild in its operation than the other kinds of aloes. The *Cape aloes* differ from the Socotrine in possessing a stronger and less agreeable odour. They are also of a less yellow colour, and less vitreous in appearance. The powder is of a greenish yellow, resembling gamboge, but less bright.

3rd. *Fœtid, or Caballine Aloes.*—This sort is very impure, having the appearance of bitumen. It is marked with ferru-

ginous spots on the outside, and is generally mixed with particles of burnt straw, fragments of bark, sand, &c. The powder is of a greenish brown colour, and 25 parts are soluble in water. It is not easily reduced to powder, and has the appearance of being the residuum of the boilers in which the preceding sorts were prepared, or rather, of being the residuum of the leaves from which the better parts have been already taken by one of the methods mentioned. It is chiefly used for horse medicine.

4th. *Red Aloes.*—This sort is rarely met with. It is in the form of scales, of a red and transparent appearance; and is supposed to be a natural exudation from the A. *socotrina*, which has concreted in the sun.

5th. *Mocha Aloes* resemble those brought from the Cape, but are more purgative. Little is known of this kind; but as the isle of Zocotora is so near the coast of Mocha, it is probable that they are only a variety of that so long known in commerce as the Socotrine.

6th. *Indian and Mozambique* aloes are very impure, and seem to be of an intermediate quality between the hepatic and caballine.

Qualities and Chemical Properties.—Barbadoes aloes is generally deeper coloured and more opaque than the Socotrine; it is more tough, and when broken, presents surfaces less shining; while its odour is very strong and highly offensive. Its colour when powdered is dirty yellow, and it is said to be more active than Socotrine aloes; and hence, though its price usually exceeds that of the other, it is principally employed in veterinary practice. It is composed of 42 parts of resin, 32 of extractive, the remainder consisting of a matter analogous to albumen.

Aloes, when pure, is completely soluble in water and alcohol; but the hepatic aloe only affords 86 parts of soluble matter to these menstrua. Aloes puffs up and crackles while burning, and gives out much thick smoke, that smells strongly of the aloes. When boiled in water and reduced to an extract, it loses much of its purgative property. It is stated by Murray, that the substance of the leaves does not partake of the qualities of the ex-

tract, which is contained only in vessels situate immediately under the epidermis; and this explains why it is that the inhabitants of Cochin-china are able to prepare a wholesome fecula from them. The aloes examined by Braconnot appeared to that chemist to have some particular qualities, which induced him to consider it as a distinct substance, for which he proposes the name "*amer resineux*." Trommsdorf, on the other hand, and Bouillon La Grange, and Vogel, consider it as composed of resin, and a peculiar extractive matter. M. Fabroni, in the Ann. de Chimie, (vol. xxv.) states that he procured from the leaves of the A. *Socotrina* var. *angustifolia*, aviolet dye, which resists the action of oxygen, acids, and alkalies. This juice, he says, produces a superb transparent colour, which is highly proper for works in miniature, and which, when dissolved in water, may serve, either cold or warm, for dyeing silk from the lightest to the darkest shades; and he reckons it one of the most durable colours known in nature. Aloes was used among the ancients, in embalming, to preserve bodies from putrefaction. Of this kind interpreters understand the aloes to have been, which Nicodemus brought to embalm the body of Christ. (John xix. 39.)

Adulterations.—Aloes are frequently adulterated with common resin; but according to Dr. Paris, the fraud more generally committed is that of mixing with, or substituting the inferior species for the *Socotrine*. The *Barbadoes aloes* may, independently of its want of aromatic flavour, be distinguished from the *Socotrine* by a simple test, for the latter dissolves entirely in boiling water and alcohol, whereas the former, when treated in a similar manner, leaves a considerable residue. Sometimes the *Caballine aloes* is made to appear so bright and pure, as not to be easily distinguished by the eye, even from the *Socotrine*, but its rank odour readily betrays the fraud.

Medical Properties and Uses.—It is the A. *vulgaris* and A. *Socotrina*, that produce the gum-resins used for pharmaceutical purposes; and they differ little in their medicinal effects. They are warm stimulating purgatives, particularly adapted for what is termed the melancholic temperament; and exercise a tonic power, proved by their extreme bitterness, and the bene-

ficial influence in chronic affections of the stomach and bowels, as vomiting, flatulence, loss of appetite, and other symptoms usually denominated dyspeptic. Their operation is slow, but generally effective, nor do large doses appear to exert much more power than smaller ones. The medium dose of aloes is from five to ten grains, but they are generally combined with other purgatives to obviate habitual costiveness; to remove viscidity of the intestines; and from their stimulating and tonic powers are well adapted for jaundice, chlorosis, hypochondriasis, and scrofula. Through their acting more particularly on the colon and rectum, they are efficacious in expelling ascarides, but from the same cause they occasionally produce hæmorrhoids. They also impart a stimulus to the uterine vessels, and are found beneficial as emmanagogues: pregnant women should be, therefore, cautious how they persist in their use.

In doses of two drachms, aloes produce nauseating and depressing effects upon the horse, and are therefore much used in the active diseases of this noble animal, when it is necessary to diminish the force of the circulation. From six to eight drachms of aloes, combined with soap and other ingredients, also constitute the purgative-ball usually administered.

The following are some of the principal Quack or Patent Medicines that owe their activity chiefly to the aloes they contain:—

Anderson's Pills consist of Barbadoes aloes, with a proportion of jalap, and oil of aniseed.

Hooper's Pills.—Pil. aloes with myrrh, or Rufus' pill; sulphate of iron; and canella bark, to which is added a portion of ivory black. Dr. Barlow, one of the physicians to the Bath Hospital, relates a case in which these pills were retained in the intestines nearly twelve months. The facts detailed in this case are valuable, from the cautions which they suggest to regular practitioners,—who in administering pills with iron, should be careful to ensure their ready solution by appropriate combination, and also by having them always freshly prepared.—See "Lancet," vol. xi. p. 806.

Dixon's Antibilious Pills.—These are composed of aloes, scammony, rhubarb, and tartar emetic.

Speediman's Pills.—Myrrh, aloes, rhubarb, of each one ounce, extract of chamomile, half an ounce; beat into a mass with syrup, and divided into four-grain pills.

James's Analeptic Pills.—Gum ammoniacum, pill aloes with myrrh. antimonial powder, of each equal parts, made into a mass with tincture of castor.

Dinner Pills: Lady Webster's, or Lady De Crespigny's Pills.—These popular pills are the "pilulæ stomachicæ," vulgo "pilulæ ante cibum" of the Codex Medicamentarius Parisiensis. Editio Quinta, A. D. 1758.

Take of Aloes, 6 drachms.

Mastich
Red rose leaves } of each, 2 drachms.

Syrup of wormword, as much as may be necessary to form a mass, which is to be divided into pills of 3 grains each.

Fothergill's Pills.—Aloes, scammony, colocynth, and oxide of antimony.

Peter's Pills.—Aloes, jalap, scammony and gamboge, of each 2 drachms; calomel, 1 drachm.

Radcliff's Elixir.—Take of Socotrine aloes, 6 drachms; cinnamon bark, zedoary root, of each ½ drachm; rhubarb, 1 drachm; cochineal, ß drachm; syrup of buckthorn, 2 ounces; proof spirit, 1 pint; water, 5 ounces. Mix.

Beaume de Vie is the compound decoction of aloes.

Off. Prep.—Pulv. aloes comp. *L.* Pilula aloes. *E.D.* Pil. aloes comp. *L.* Pil. aloes cum myrrha. *L.E.D.* Pil. aloes et assafœtidæ. *E.* Pil. aloes c. colocynthide. *E.* Pil. cambogiæ comp. *L.* Pil. Rhæi comp. *E.* Pil. scammonii comp. cum aloe. *D.* Decoctum aloes comp. *L.* Extractum aloes. *L.D.* Extractum colocynthidis comp. *L.D.* Tinctura aloes. *L.E.D.* Tinctura aloes comp. *L.E D.* Tinctura aloes ætherea. *E.* Tinct. benzoini. comp. *L.E.D.* Tinct. Rhæi et aloes. *E.* Vinum aloes *L.E.D.*

Pl 111.



Allium sativum.

G.Reid. Del.

London Published by J. Churchill, Leicester Square April 1.1829.

ALLIUM SATIVUM.

Common Garlic.

Class VI. HEXANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. SPATHACEÆ, *Lin.* ASPHODELI, *Juss.* ASPHODELEÆ, *Brown, &c.* ASPHODELACEÆ, *Burn.*

GEN. CHAR. *Perianth* inferior, 6-parted, spreading. *Spathe* many-flowered. *Umbel* crowded. *Stigma* acute. *Seeds* angular.

SPEC. CHAR. *Stem* leafy; leaves flat. *Umbel* bulbiferous; bulbs compound. *Stamens* 3-cleft.

Syn.—Allium, *Ger. Em.* 177; *Park. Parad.* t. 511. *f.* 6; *Camer. Epit.* 328.
Allium vulgare et sativum, *Bauh. Pin.* 73; *Hist.* 2. 554; *Trag. Hist.* 745; *Raii. Hist.* 1125.
Allium hortense, *Fuchs. Hist.* 696. *c.* 282.
Allium staminibus alterne trifidis, &c. *Hall. Opusc.* 331. *n.* 1.
Allium sativum, *Lin. Sp. Pl.* 425; *Willd. v.* 2. 63; *Woodv. v.* 3. *t.* 108; *Stokes, v.* 2. *p.* 216.

FOREIGN.—*Ail, Fr.*; *Ajo*, Sp.; *Alho*, Port.; *Gartenlauch*, Ger.; *Hvilöken*, Swed.; *Tschenok*, Russ.; *Suón*, Chin.

THE common or cultivated Garlic is a hardy, perennial, bulbiferous plant, growing naturally in Sicily and the south of France; flowering in July, and has been cultivated in this country since 1548. It shows the same propensity to form bulbs instead of flowers as the A. *Scorodoprasum*, or Rocambole Garlic, which it also resembles in other respects.

The bulbs are composed of several oblong, subordinate bulbs, called cloves, of a pale colour internally, frequently tinged with purple on the outside, and enclosed in a common membrane, from the base of which proceed long white fibrous roots. Each clove being planted, grows, and in one season attains the size and structure of the parent bulb. The stem is simple, erect, solid, and rises about two feet in height, surrounded with many long, flat, linear, pointed leaves, of a yellowish green colour; and is terminated by a dense umbel, inclosed in a spathe containing both flowers and bulbs, which opens at one side and withers. The flowers are small and white, the perianth consists of six oblong petals, with tapering alternately 3-cleft filaments, shorter than the corolla, and supporting oblong, erect anthers: the germen is superior, short, angular, bearing a simple style, with a pointed stigma: the capsule is short, broad, 3-lobed and 3-celled, containing a few roundish, angular seeds. Fig. (*a*) represents a flower; (*b*) the bulb; (*c*) a subordinate bulb, or clove.

This plant is the Σκοροδον of the Greeks, and is said to have been called Σκοροδον, *quasi*, *σκόριον ῥοδον*, *rudis rosa*, on account of its offensive odour. Amongst the Greeks, garlic was held in such abhorrence, that those who partook of it were regarded as profane. The Egyptians, however, worshipped it; and the Romans gave it to their labourers to impart strength, and to their soldiers to excite courage: their game cocks were also fed with garlic previous to fighting. From the following lines of Persius, it appears that it was sometimes offered to propitiate the Gods:—

> "Hinc grandes Galli, et cum Sistro lusca sacerdos.
> Incussere Deos inflantes corpora, si non
> Prædictum, ter mane, caput gustaveris Alli."

Let this be as it may, Horace having supped with Mæcenas, found himself very ill, in consequence of partaking of a dish of herbs in which garlic had been put, and upon this writes an ode to his friend, in which he condemns it in no measured terms.

Notwithstanding the denunciations of Horace, Olerius states that garlic was much used in his time by nobles and courtiers;

and Haller avers that the inhabitants of all countries are very fond of it. It appears, from Tusser, to have been cultivated in the time of Queen Mary; who says in his twelfth verse for November—

"Set garlicke and beans at St. Edmund the king."

Garlic is now usually propagated by detaching the cloves, and planting them in February or March; and in this way it seldom throws up a flower-stem. The soil should be light and dry; the sets are placed about four inches asunder, and between two and three inches deep. About the middle of June the leaves are tied in knots, to prevent the stronger plants from spindling or running to flower, and to promote the swelling of the bulbs. The crop is dug up in autumn, when the leaves begin to wither; the bulbs are then cleaned, tied in bunches, and hung in a dry room for use.

Besides the common garlic, the following species are frequently cultivated in our gardens for culinary and other domestic purposes.

1. Allium Schœnoprasum. The *Cive*, or *Chive Garlic*, is a small plant, with a naked stalk seldom exceeding five or six inches in height; cylindrical, hollow, somewhat tapering leaves, and simple stamens. It is a native of Britain, growing in meadows and pastures, but is not common; it occurs, according to Mr. Neill, among other places, in the south of Scotland, on low hills near Hawick; and also in some parts of Westmoreland: it is figured in "English Botany," v. 34, t. 2441. The bulbs are very small and flat, and grow connected together in clusters. The young leaves are employed principally for soups, and as a salad ingredient, in the spring. Sometimes they are added as a seasoning to omelets; and they are often eaten with bread and butter.

2. Allium Ascalonicum. The *Ascalonian Garlic*, or *Shallot*, with a naked stem, awl-shaped leaves, globose umbels, and

3-cleft stamens, is a perennial plant, a native of the Holy Land, where it was observed by Haselquist. Eschalot (*Eschalotte*, Fr.) is the more correct appellation, the name being thus derived by some old authors, (Bauhin for example,) and it is styled *cepa sterilis*, or barren onion, from the circumstance of its seldom sending up a flower-stalk. It was cultivated here in 1633. In size and general growth the plant resembles the Chive; but it produces bulbous roots composed of cloves like garlic. These are used for culinary purposes in the manner of garlic, but they are milder, and do not communicate to the breath the offensive flavour which garlic or even raw onions impart.

3. Allium Scorodoprasum. *Rocambole Garlic; Ail d'Espagne* of the French, is a perennial plant, indigenous to Sweden and Denmark, and was cultivated by Gerarde in 1596. It has compound bulbs, like the common garlic, but the cloves are much smaller. It sends up a stem two feet high, which is bulbiferous; the leaves are rather broad and crenate at the edges; the flowers, which are collected in a sort of globular head, are of a pale purple colour. The cloves are used in the same manner as garlic or shallot, and nearly for the same purposes.

4. Allium Fistulosum. *Cibol* or *Welsh Onion; Le Ciboule de St. Jaques* of the French, is a perennial plant, a native of Siberia. It appears to have been cultivated in 1629, but it was known a long time previously. It produces no bulbs, but the fistular leaves, and the lower part of the stems, are much used in salads, in the spring months.

Qualities and Chemical Properties.—Every part of the common garlic has an offensive odour, and a biting acrimonious taste, particularly the bulbs, which when dried, lose nearly two thirds of their weight. The expressed juice is of a thick consistence like mucilage, and slightly reddens vegetable blues. When diluted with water and filtered, it yields flakes of albumen if h eat be applied The residue consists chiefly of mucilage,

which garlic yields a very great proportion, and of extractive. This last is somewhat acrid in its nature. When garlic is distilled with water, it yields a portion of yellow-coloured volatile oil, at first lighter than water, but gradually becoming heavier as the distillation advances. To this oil garlic owes its most remarkable properties. Its taste is very acrid, and its smell strong. When applied to the skin, it produces an irritation not inferior to cantharides, and, like it, might be employed to blister the skin. When triturated with oxide of iron, it immediately strikes with it a black colour; but it has no effect upon any other metallic oxide. When garlic is heated with alcohol, the liquid assumes a reddish-yellow colour, and leaves, on evaporation, a brown extract, very acrid, which extracts moisture from the air. When garlic is distilled, it yields first a liquid slightly coloured, and having a very acrid taste; then a thick brown oil, and abundance of inflammable air and carbonic acid. The liquid in the receiver emits the smell of ammonia when mixed with lime. When 40.320 parts of garlic were incinerated, they left 4996 parts of ashes, or about one-eighth of the original weight. From 172 parts of pure ashes Cadet obtained the following substances:—

Potash	58·0
Sulphate of soda, with some muriate	33·0
Alumina	2·0
Phosphate of lime	15·6
Oxide of iron	1·5
Magnesia	9·0
Lime	14·0
Silica	8·0
	141·1

From 1406 parts of fresh garlic he obtained—

Mucilage	520
Albumen	37
Fibrous matter	48
Water, by estimate	801
	1406

Bouillon-Lagrange has detected in garlic, besides the acrid oil, a quantity of sulphur, starch, and saccharine matter.

Medical Properties and Uses.—Garlic resembles the squill in its medical properties, being diuretic, diaphoretic, and expectorant. Cullen asserts that it acts as a stimulus more promptly and energetically than any other, and it is much commended by Bergius for its virtues in agues; in dropsical affections by Sydenham; and in scurvy by Dr. Lind. It has long been celebrated as a domestic remedy for worms; and instances are related by Mosentein and Tissot of its expelling tænia; the usual method of administering it being to give the expressed juice in a little milk, or to boil it with sugar to form a syrup: it is however rarely used in modern practice, having given place to remedies of more decided utility, and less nauseous to the taste. In France, the expressed juice diluted, is occasionally injected into the rectum, to dislodge ascarides; and is much employed in asthma, catarrh, and torpor of the abdominal viscera. Sydenham extols the application of garlic to the soles of the feet, as an efficacious method of producing revulsion from the head; and it is occasionally applied in the form of poultice to boils and indolent tumours. Given in considerable doses, garlic is capable of producing inflammation of the alimentary canal; but taken in moderation, is considered highly beneficial to soldiers and sailors when exposed to a damp atmosphere; and is recommended to make part of the regimen of those who are exposed to the plague and other pestilential disorders. Celsus recommends garlic mixed with rue, as an external application against the bites of scorpions and venomous spiders: "Et ad scorpionis autem et ad aranei ictum, allium cum ruta recte miscetur, ex oleoque contritum, superimponitur."—*De Med. l.* v. *c.* xxv. 6.

Dr. Paris asserts, that the most powerful antidote to the flavour of this tribe of vegetables will be found in the aromatic leaves and seeds of the *umbelliferæ;* and if leek or garlic be mixed with a combination of aromatic ingredients, their virulence will be greatly mitigated and corrected; a fact which did not escape the observation of the husbandman in Virgil:

" Allia, Serpyllumque, herbas contundit olentes."
Eclog. 2. line 11.

Menander also states that *baked beet-root* entirely takes off the odour of garlic.

OFF. PREP.—Syrupus allii. *D.*

TAYLOR'S REMEDY FOR DEAFNESS, is garlic infused in oil of almonds, and coloured by alkanet root.

ALLIUM PORRUM.—*The Leek.*

SPEC. CHAR. *Umbel* globose. *Stem* smooth. *Leaves* flat. Three outer *sepals* scabrous on the outside. *Stamens* 3-cleft. *Bulb* coated.

Syn.—Porrum capitatum, *Ger. Em.* 174; *Fuchs. Hist.* 605.
Porrum, *Bauh. Hist. v.* 2. 551; *Camer. Epit.* 321; *Park. t.* 511. *f.* 5; *Raii. Hist.* 1126.
Allium porrum, *Lin. Sp. Pl.* 423; *Willd. v.* 2. *p.* 64; *Hall. Helv. n.* 1217; *Plenck. Icon. t.* 253; *Stokes, v.* 2. *p.* 227.
FOREIGN.—*Poireau*, Fr.; *Porro*, It.; *Spanische lauch*, Ger.

THE Leek is a biennial plant, a native of Switzerland, flowering in May. It is mentioned by Tusser in 1562, but was no doubt known in this country long before that date. There are three varieties; the narrow-leaved, or Flanders leek; the Scotch, or flag leek, sometimes called the Musselburgh leek; and the broad-leaved, or tall London leek. The latter variety is often cultivated; but for exposed situations, Mr. Patrick Neill recommends the Scotch leek, being much the more hardy.

The bulbs are white, globose, composed of concentric circles, on a radical plate, from which spring fibrous roots. The stem,

which is an erect scape, rises three feet, and is leafy at bottom; the leaves flat, linear, pointed, and an inch wide. The flowers are in in close, very large spherical umbels, on purplish peduncles. The corolla is bell-shaped; petals purplish, rough-keeled, the three outer oblong, lanceolate, glabrous at the margin, inner oblong, broader; stamens rather longer than the corolla, three of them toothed at the margin; germen superior; style simple, stigma acute.

Qualities.—The scent of the whole plant is pungent, and its taste extremely acrimonious. By boiling, the essential oil is dissipated on which its active properties depends, and it becomes comparatively bland and insipid.

Medical Properties and Uses.—Its medical uses are similar to those of garlic, but less energetic. Its great acrimony renders it stimulant, and it is probably, as before said, diuretic; hence the expressed juice is sometimes given with advantage in dropsical cases, in doses from ʒß. to ʒij, mixed with mucilage or syrup. The whole plant is used as a pot-herb; but the blanched stem is most esteemed. It is in season in winter and spring, and is chiefly used in soups and for stewing.

ALLIUM CEPA.—*Common Onion.*

Spec. Char.—*Scape* naked, tubular, swelling out below, longer than the leaves. *Leaves* cylindrical, smooth. *Umbel* subglobose. Petals nearly equal.

Syn.---Cepa vulgaris, *Raii Hist.* 1116.
Cepa alba, *Ger. Em.* 169.
Allium cepa, *Lin. Sp. Pl.* 431; *Willd. v. 2. p.* 80; *Plenck, Icon.* t. 255.
Foreign.---*Ognon*, Fr.; *Cipolla*, It.; *Cebolla*. Sp.; *Swiebel*, Ger.; *Pecáj*, Hind.

The common Onion is a biennial plant, too well known by its fistular leaves, swelling stalk, and bulbous root, to require a particular description. Neither the native country of the plant, nor

the date of its introduction, is known. The bulb is globose, simple, and formed of concentric circles. The stem is naked, swelling below, with smooth tubular spreading pointed leaves sheathing at the base. The flowers appear in a close head or capitulum in June and July.

The principal varieties in cultivation are the Strasburgh, or common oval; the Spanish, silver skinned, and red skinned; the globe onion, the Reading, and the Portugal. The *tree onion*, which is figured and described in the "Botanical Magazine," t. 1469, as a variety of Allium *Cepa*, is cultivated in some gardens. The *scallion* is another variety of A. *Cepa*, distinguished by the circumstance of its never forming a bulb. Miller states, that the scallion is propagated by parting the roots in autumn; that it grows in almost any soil or situation, and resists our severest winters. He adds, that being green and fit for use very early in the spring, it is worthy of a place in all kitchen gardens. It was, indeed, formerly much in use; but the true scallion is very little known; and is said to exist only in a few gardens, where it is preserved by way of curiosity. The Egyptian onion, or Ground onion, has been considered another variety of Allium *Cepa*, but according to Mr. Neill is more nearly allied to the A. *fistulosum*. Instead of producing bulbs at the top of the stem, like the former, this plant produces clusters at the surface of the ground. It was brought from Egypt, it is believed, during the occupation of that country by the British army, and was first cultivated in the neighbourhood of Edinburgh in 1811, by Lieut. Burn of the Royal Navy. In quality the ground onion seems not inferior to the common onion, and it more speedily reaches maturity, being planted in April, and reaped in August and September.

Qualities.—The sensible, as well as chemical qualities of the onion resemble those of garlic; but are much weaker. On distillation it yields a small portion of acrid volatile essential oil, combined with sulphur; and the recent juice contains sugar, mucus, phosphoric acid, phosphate of lime, and citrate of lime.

Medical Properties and Uses.—The onion is chiefly

cultivated for culinary purposes. The bulbs afford a considerable proportion of alimentary matter, principally mucilage, particularly when boiled; but in dyspeptic habits they occasion flatulence, thirst, and headache. The bulb is the most active part, and is stimulant, diuretic, and expectorant. "On account of the free phosphoric acid it contains, the juice is supposed to be useful in calculous cases, as it dissolves phosphate of lime out of the body. Onions are, however, scarcely ever employed, except externally, as suppurative cataplasms; for which purpose they are generally roasted, split, and applied to tumours."

Pl 772



Styrax Benzoin.

CXII

STYRAX BENZOIN.

Benzoin Storax, or Benjamin-Tree.

SPEC. CHAR. *Leaves* ovate, pointed, entire; downy beneath. *Clusters* axillary, compound.

Syn.—Arbor Benzoini, *Grimm in Eph. Acad. Nat. Curios. dec. 2. ann. 1. 370.*
Benjui, *Garcius, ab Horto in Clus. Exot. p. 155; Sylv. in Valent. Hist. Simpl. p. 487.*
Benzuin, *Radermacher in Act. Societ. Batav. v. 3. p. 44.*
Benjamin, or Benzoin, *Marden Hist. of Sumatra, p. 123.*
Laurus Benzoin, *Houttwyn in Act. Harlem, v. 21. p. 265.*
Styrax Benzoin, *Dryander in Phil. Trans. v. 77. 308. t. 12; Willd. n. 2; Woodv. t. 72.*

FOREIGN.—*Benzoin*, Fr.; *Benzuino*, It.; *Benjui*, Sp.; *Benzoe*, Ger.; *Lubán*, Hind. and Arab.

THOUGH Garcias ab Horto, Grimm, and Sylvius, were acquainted with the real tree from which the resinous substance called Benzoin is collected, its botanical characters were entirely unknown to modern authors till about the year 1787, when Dryander fully ascertained it to be a Styrax. This was done at the request of the late Sir Joseph Banks, who obtained proper specimens of the tree from Mr. Marsden at Sumatra, where it is a native. Ray had erroneously supposed it to be the production of a North American shrub, thence called by Linneus, Laurus *Benzoin*. The latter, in correcting this error, fell into a no less mistake, making the Benjamin-tree a Croton in Mant. 2,294 and a Terminalia in the Supplement 434. To this he is supposed to have been led by the French name of this Croton or Terminalia, *(Bien-joint,)* but he gives a better reason in justification of himself in the *Supplementum*, where he informs us that a piece of the true *Benzoe*, brought by Thunberg, very closely agreed, in its singular bark, with the tree before him, which grew in the stove at Upsal.

The Benzoin Styrax is of quick growth, and rises to a considerable height; it sends off many strong, round branches, which are covered with a fine downy and hoary bark. The leaves are about four inches long and two broad, alternate, on short footstalks, quite entire, pointed, oblong, elegantly reticulated with triply compound prominent veins, smooth on the upper surface, and clothed beneath with a fine dense hoary down. The flowers are in compound axillary clusters, seldom so long as the leaves, alternately branched, with angular downy stalks, and a few small, oblong, concave, more downy, deciduous bracteas. The flowers are from six to twelve in one cluster, smaller than those of Styrax *officinale*, and usually hang all upon the same side. The calyx is bell-shaped, downy, with very minute teeth; the corolla consists of five linear obtuse petals, four times longer than the calyx, connected together at the base, externally cineritious, and somewhat silky rather than downy. The filaments are ten, shorter than the petals, inserted into the receptacle connected at the base into a tube almost as long as the calyx, and crowned with linear erect anthers. The germen is superior, ovate, and tomentose, with a slender style, and simple stigma. The fruit is similar to that of Styrax *officinale*.—Fig. (*a*) corolla; (*b*) anthers; (*c*) calyx, germen, and style.

In some of the northern parts of Sumatra, particularly near the sea-coast, there are several extensive plantations of these trees. The fruit being sown in the rice fields, springs up, and the young plants require only that the surrounding shrubs should be cleared away from them. When the trees have attained the age of six or seven years, incisions are made in the bark, from which the balsam exudes in the form of a thick, whitish, resinous juice. By exposure to the air, this juice soon hardens; it is then pared from the bark with a knife or chisel. For the first three years the trees yield the purest resin: this is of a white colour, inclining to yellow, soft and fragrant. Afterwards, for the next seven or eight years, an inferior sort is yielded; this is of a reddish yellow colour, degenerating to brown. At length the trees, unable to bear a repetition of the process, are cut down, and split into pieces. From these is pro-

cured, by scraping, a still worse sort of benzoin, which is dark-coloured, hard, and mixed more or less with parings of the wood and other impurities.

The inferior sorts of benzoin are exported to Arabia, Persia, and some parts of India, where they are burned, to perfume, with their smoke, the temples and houses of the inhabitants; to expel troublesome insects, and obviate the pernicious effects of unwholesome air or noxious exhalations.

Benzoin is brought for sale to the mercantile parts of Sumatra, in large cakes, covered with mats. In order to pack it in chests, it is necessary to break these cakes, and to expose the benzoin to the heat of the sun. The greater part which is brought to England is re-exported to countries where the Roman Catholic and Mahomedan religions prevail; to be there burned in the churches and temples. The exportation of benzoin from London to Magadore only has been estimated at 30,000 pounds weight per annum.

"CHEMICAL PROPERTIES.—Only three solid balsams are at present known; viz. *Storax, Dragon's blood,* and *Benzoin. Benzoin* has a very agreeable odour, which is increased by heat. It has little taste. Its specified gravity is 1,092. This substance has been used in medicine for ages, and various processes have been pointed out by chemists for extracting benzoic acid from it: but the only person who has examined its properties in detail is Mr. Brande.

"Cold water has very little effect on benzoin, but boiling water takes up a portion of benzoic acid.

Alcohol dissolves it when assisted by a gentle heat, and forms a deep yellow solution inclining to reddish-brown. When this solution is diluted with water, the benzoin precipitates in the form of a white powder. It is precipitated also by muriatic and acetic acids, but not by the alkalies. A few drops of sulphuric acid likewise precipitate the benzoin; but an additional quantity will redissolve it, and form a liquid of the colour of port wine. When equal quantities of the alcoholic solution of benzoin and sulphuric acid are mixed, a dark-pink precipitate falls. The liquid assumes a pink colour, which becomes lilac when diluted with water. Nitric acid occasions a strong effervescence, and forms a dark-red fluid with the alcoholic solution, but throws down no precipitate.

"Ether dissolves benzoin with facility, and the solution, with re-agents, exhibits the same phenomena as the alcoholic.

"Nitrid acid acts with violence on benzoin, and converts it into an orange-coloured mass. When assisted by heat the acid dissolves the benzoin; and as the solution cools, crystals of benzoic acid gradually separate. Mr. Hatchett ascertained that by this process a quantity of artificial tannin is formed.

"Sulphuric acid dissolves benzoin, while benzoic acid, as Hatchett discovered, sublimes; the solution is at first a deep red. By continuing the digestion, a portion of artificial tannin is formed, and the charcoal evolved amounts to 0.48 of the benzoin dissolved.

"Acetic acid dissolves benzoin without the assistance of heat. When heat is applied, the solution, as it cools, becomes turbid, owing to the separation of benzoic acid.

"Benzoin is dissolved by a boiling lixivium of the fixed alkalies; a dark-brown solution is formed, which becomes turbid after some days' exposure to the air. Ammonia likewise dissolves benzoin sparingly.

"When Mr. Brande exposed 100 grains of benzoin in a retort to a heat gradually raised to redness, the products were,

Benzoic acid	9·0
Acidulous water	5·5
Butyraceous and empyreumatic oil	60·0
Charcoal	22.0
Carburetted hydrogen and carbonic acid	3.5
	100·0

"Bucholz subjected 1500 grains of benzoin to a chemical analysis. He obtained the following substances:

Resin	1250
Benzoic acid	187
Substance similar to balsam of Peru	25
Aromatic substance soluble in water and alcohol	·8
Woody fibres and impurities	30
	1500

"*Benzoic acid.*—This substance was described, as long ago as 1608, by Blaise de Vigenere, in his treatise on fire and salt, under a name by which it is familiarly known, viz. *Flowers of Benzoin* or *Benjamin.*

"The usual method of obtaining this acid is to put a quantity of benzoin, coarsely powdered, into an earthen pot, to cover the mouth of the pot with a cone of thick paper, and then to apply a very moderate sand heat. The benzoic acid is sublimed, and attaches itself to the paper. This method was tedious and difficult; it being hardly possible to prevent the heat from scorching the benzoin, and volatilizing some empyreumatic oil, which soils and injures the acid sublimed. Neuman proposed moistening the benzoin with alcohol. and distilling it in a retort with a slow heat. The acid comes over immediately after the alcohol, partly in crystals, and partly of the consistence of butter. Geoffroy ascertained, in 1738, that this acid may be obtained by digesting benzoin in hot water. A portion is taken up, which is deposited in crystals as the water cools. Scheele published a different method in 1775; which being easier and more productive than any of the preceding, is now preferred. This process is as follows: Upon four parts of unslacked lime pour twelve parts of water, and after the ebullition is over add 96 parts more of water; then put twelve parts of finely pounded benzoin into a tinned pan; pour upon it first, about six parts of the above milk of lime, mix them well together, and thus

successively add the rest of the mixture of lime and water. If it be poured in all at once, the benzoin, instead of mixing with it, will coagulate, and run together into a mass. This mixture ought to be boiled over a gentle fire for half an hour with constant agitation; then take it from the fire, let it stand quiet for an hour, in order that it may settle; pour off the supernatant limpid liquor into a glass vessel. Upon the remainder in the pan pour 96 parts of pure water: boil them together for half an hour, then take it from the fire, and let it settle; add the supernatant liquor to the former; pour upon the residuum some more water, boil it as aforesaid, and repeat the same process once more. At last put all the residuums upon a filtre, and pour hot water several times upon them. During this process the calcareous earth combines with the acid of benzoin, and separates it from the resinous particles of this substance. A small quantity of the resin is dissolved by the lime-water, whence it acquires a yellow colour. All these clear yellow leys and decoctions are to be mixed together, and boiled down to twenty-four parts, which are then to be strained into another glass vessel.

"After they are grown cold, muriatic acid is to be added, with constant stirring, till there be no farther precipitation, or till the mass taste a little sourish. The benzoic acid, which was before held in solution by the lime, precipitates in the form of a fine powder.

"Mr. Hatchett has observed, that when benzoin is digested in sulphuric acid, a great quantity of beautifully crystallized benzoic acid is sublimed. This process is the simplest of all, and yields the acid in a state of purity; it claims, therefore, the attention of manufacturers.

"Benzoic acid, thus obtained, is a fine, light, whitish powder, which is not brittle, but has rather a kind of ductility. Its taste is sweet, hot, and somewhat bitter. Its odour is slight, but peculiar and aromatic. Its specific gravity is 0·657. It hardly affects the infusion of violets, but it reddens that of turnsole, especially when hot.

"Heat volatilizes this acid, and makes it give out a strong odour, which excites coughing. When exposed to the heat of the blow-pipe in a silver spoon, it melts, becomes as fluid as water, and evaporates without taking fire. It only burns when in contact with flame, and then it leaves no residuum behind. When thrown upon burning coals, it rises in a white smoke. When allowed to cool after being melted, it hardens, and a radiated crust forms on its surface. When distilled in close vessels, the greater part of it sublimes unaltered, but some of it is decomposed. This portion is converted almost entirely into oil and carburetted hydrogen gas.

"This acid is not altered by exposure to the air. Two hundred parts of cold water dissolve 1 part of it; but 1 part of it dissolves in 24½ parts of boiling water.

"Neither the simple supporters of combustions nor combustibles have any sensible action on it at the common temperature of the air, as far as is known. But very few experiments have been made on the subject.

"It combines with alkalies, earths, and metallic oxides, and forms salts known by the name of *benzoates*. The alkaline benzoates are soluble in water. So are the benzoates of barytes, strontian, and magnesia. Those of alumina, yttria, and lime, are but sparingly solu-

ble. The only metallic salts which form insoluble precipitates when mixed with benzoate of ammonia are those of tellurium, mercury, and iron. Tellurium and mercury are precipitated white; and iron orange. Berzelius has proposed benzoate of ammonia as an excellent agent for precipitating iron and separating it from other bodies with which it may be united. From the experiments of Hisinger the method appears to be a good one, provided the iron be in the state of peroxide and the liquid contain no excess of acid.

"Concentrated sulphuric acid dissolves benzoic acid without heat, or any other change, except becoming somewhat brown: when water is poured into the solution, the benzoic acid separates, and coagulates on the surface without any alteration. Nitric acid presents precisely the same phenomena, as does also the sulphurous acid. Neither the muriatic nor the phosphoric acids dissolve it. Acetic acid, when hot, dissolves it precisely as water does; but it crystallizes again when the acid cools.

"Alcohol dissolves it copiously, and lets it fall on the addition of water. Boiling alcohol takes up its own weight. One hundred parts of cold alcohol dissolve scarcely 56 parts of benzoic acid.

"This acid is sometimes used as a medicine, but much less frequently than formerly.

"Benzoic acid has been analysed with much accuracy by Berzelius. According to his experiments, it is a compound of

Hydrogen . . .	5·16	or 6 atoms	=	0·75
Carbon	74·41	15	=	11·25
Oxygen	20·43	3	=	3·00
				15·00.

"According to this analysis it contains 24 atoms, and an integrant particle of it weighs 15. The constitution of benzoate of lead agrees very well with this determination. According to the analysis of Berzelius, it is composed of

Benzoic acid	100	. . .	14·893
Yellow oxide of lead . .	94	. . .	14

The equivalent for benzoic acid according to this salt is 14·893, which does not differ 1 per cent. from the number obtained by the analysis of the acid itself.

"Chemists had long suspected that an acid could be obtained from tallow, on account of the acrid nature of the fumes which it emits at a high temperature; but it was M. Grutzmacher who first treated of it particularly, in a dissertation *De Ossium Medulla*, published in 1748. Mr. Rhades mentioned it in 1753: Segner published a dissertation on it in 1754; and Crell examined its properties very fully in two dissertations published in the Philosophical Transactions for 1780 and 1782. It was called at first *acid of fat*, and afterwards *sebacic acid*.

"But at the period when these chemists made their experiments, the characteristic properties of the different acids were not sufficiently known to enable them to distinguish acids from each other with precision. Thenard examined the subject in 1801, tried all the processes of Crell and Guyton Morveau, and found that the acids procured by them were either acetic or the acid employed in the process. Thenard found, however, that a peculiar acid was formed during the distillation of

tallow. To it he consigned the appellation of *sebacic acid.* The experiments of this chemist were repeated in 1804 by Mr. Rose, who obtained similar results, and confirmed all the observations of the French philosopher. The subject soon after was resumed by Berzelius, who in an elaborate dissertation, published in 1806, proved that the sebacic acid of Thenard is nothing else than benzoic acid contaminated with some unknown substance derived from the fat, which alters some of its properties, but from which it may be freed by proper precautions. There does not therefore exist, as far as we know at present, any acid to which the name of sebacic acid belongs."

Benzoic acid has been also found in the urine, particularly when there is a deficiency of phosphoric acid in it. Fourcroy and Vauquelin state that it exists always in the urine of graminiverous animals; but this has been denied by M. Giese. When it exists in the animal kingdom it is usually in combination with potash or lime.

Medical Properties and Uses.—This balsam was formerly considered to be expectorant, and was esteemed for its virtues in asthma and other pulmonary affections: it is now, however, little used in practice, and is chiefly valued as yielding the *benzoic acid* which is somewhat stimulating, and imparts a pleasant flavour to other medicines.

Benzoin is also used in the preparation of what is called *court plaster*, which it sometimes renders too irritating. The mode of making it, is as follows:—Five ounces of isinglass are dissolved in a pint of water. A quantity of thin black sarcenet being stretched on a frame, this solution is applied warm with a brush equally over the surface; and, when dry, the process is repeated a second or third time. It is finally brushed over with a weak solution of benzoin in spirits of wine, which communicates to it a pleasant aromatic smell.

Benzoin also enters into the composition of the following preparations:—

1. *Fumigating Pastilles.*

Take of Benzoin, 1 drachm.
Cascarilla bark, ½ drachm.
Myrrh, 1 scruple.
Oil of nutmegs, Oil of cloves } of each, 10 drops.
Nitrate of potass, ½ drachm.
Charcoal, 6 drachms.

Mucilage of gum tragacanth, as much as may be required, to cause the mass to adhere; after which it is to be divided and cut into the usual form.

The following is the French method of preparing pastilles:—

" Prenez, Benjoin	16 parts.
Baume du Pérou sec	16
Qu'on a fait préalablement dans l'eau pour enlever tout l'acide volatil.	
Santal citrin	4
Ladanum	1
Charbon de tilleul	96
Nitrate de potasse	2

" Reduisez toutes ces substances en poudre tres fine, melez-les exactement, et faites-en, avec du mucilage de gomme adraganthe, une masse épaisse, dont vous formerez des cônes échancrés en trépied à la base, que vous ferez sécher dans un four faiblement chauffé."

2. *Virgin's Milk.*—A spirituous solution of benzoin mixed with about 20 parts of rose water, forms a well-known cosmetic. Goulard water is also sometimes sold under this title.

3. *Friar's Balsam, Wade's Drops, Jesuit's Drops.*—These preparations are nothing more than the compound tincture of benjamin.

4. *Pectoral Balsam of Honey.*—This is merely a simple tincture of benzoin, or of tolu, and like the following, is highly stimulant and improper for those diseases for which it is usually commended.

5. *Essence of Coltsfoot*, consists of equal parts of balsam of tolu, and the compound tincture of benzoin, to which is added double the quantity of rectified spirits of wine. It is recommended for coughs and consumptions!!

Riga Balsam.—Take of alcohol or rectified spirit, eight ounces; compound tincture of benzoin, two drachms; tincture of saffron, one drachm: mix. A popular nostrum for sprains and bruises; recommended also as a *vulnerary!*

Off. Prep.—Acidum Benzoicum. *L. E. D.*

Tinct. Benzoini composita. *L. E. D.*

Pl. 113



Secale cereale

Ergot or Spurrid Rye

Vict. del. S.

TRITICUM HYBERNUM.

Winter, or Lammas Wheat.

Class III. Triandra.—*Order* II. Digynia.

Nat. Ord. Gramina, *Lin.* Gramineæ, *Juss.* Graminales, Triticinæ, Hordeaceæ, *Burn.*

Gen. Char. *Glume* of 2 transverse, nearly equal, opposite valves, many-flowered, shorter than the spikelet.

Spec. Char. *Glume* four-flowered, tumid, smooth, imbricated, with little or no awns.

Syn.—Triticum spicâ muticâ, *Ger. Em.* 65. *f.* 1; *Park. Theatr.* 1120. *f.* 1.
Triticum hybernum aristis carens, *Bauh. Pin.* 21; *Mor. Hist.* 3. *t.* 11. *f.* 1.
Tourn. Inst. t. 29.
Triticum vulgare, *Host. Gram. Austr. v.* 3. 18. *t.* 26.
Triticum hybernum, *Lin. Sp. Pl.* 126; *Willd. v.* 1. 477; *Errh. Pl. Offic. n.* 151; *Ait. Kew. v.* 2. *ed.* 2. *p.* 180.

The native country of this valuable grain, which now constitutes the chief food of the inhabitants of this and other European nations, is entirely unknown. It has, however, been conjectured, from the nature and habits of wheat, that it may have come originally from the hilly parts of Asia, and been rendered hardy by time and cultivation, in this and most parts of the world. Under the equator, wheat will seldom form an ear below the elevation of 4,500 feet, or ripen above that of 10,800; and it will not vegetate beyond the 62° of northern latitude. The English counties most distinguished for the quantity, as well as the quality, of their wheat, are Kent, Essex, Suffolk, Rutland, Herefordshire, Berkshire, Hampshire, and Hertfordshire. In the more northern parts of the island, this grain is of inferior quality, being cold to the feel, dark coloured, and yielding comparatively little flour. In the best wheat-counties, and in good years, the weight of a bushel of wheat, eight gallons to the bushel, is said to be from sixty to sixty-two pounds. In the isle of Sheppy, in Kent (where, perhaps, the best samples of

wheat sent to the London market are produced,) this grain, in some favourable seasons, weighs sixty-four pounds the bushel. Where the climate is naturally colder, wetter, and more backward, or in bad seasons, the weight of the bushel of wheat is not more than fifty-six or fifty-seven pounds. The kinds of wheat cultivated by the farmer are numerous; but the species here figured, is sown in autumn, stands the winter, and ripens its seed in the following summer. Of all the varieties this is the most generally cultivated in this country as being the most suited to the nature and quality of the soil and climate, and as affording the finest kind of flour. The soils best adapted to the growth of this grain are rich clays and heavy loams.

The root consists of many downy fibres. The stems are jointed, from three to four feet high, straight, smooth, and terminated by a longish ear or spike. The leaves are linear, smooth, pale green, sheathing, and jointed. The spike is three or four inches long, inclining, and composed of numerous imbricate, oblong, ovate, 2-ranked spikelets; the glume consists of two concave, oblong, keeled, smooth, nearly equal valves; the outer ones near the top generally terminated by very short awns, which distinguish it from spring wheat, (Triticum *æstivum,*) which has awns three inches long; they contain for the most part from three to four florets, three of which are usually productive; the outer valve of the glumella is concave and pointed, the inner one flat, 2-toothed, and blunt; the filaments are capillary, bearing linear, forked anthers: the germen is turbinate, with a short style, and feathery stigmas. The germen is ovate, translucent, with a narrow channel along the upper side, and enveloped in the glumella.—Fig. (*a*) represents a spicula of the T. *hybernum* of its natural size; (*b*) the germen and glume; (*c*) a flower expanded and considerably magnified.*

* A common indigenous perennial grass, belonging to the present genus, vulgarly denominated couch-grass, or creeping wheat-grass, (Triticum *repens,*) formerly occupied a place in our Dispensatories, under the name of *Gramen caninum*. Its long creeping roots, or rather rhizomata, which so greatly facilitate the propagation of this grass, to the no small inconvenience of the farmer, have a sweetish taste, and are said to be mildly aperient, deobstruent, and diuretic. The expressed juice taken in considerable quantities, and frequently repeated, is strongly recommended by Boerhaave, and also by Bergius, for its singular efficacy in removing obstructions, and schirrous affections of the liver.

Qualities and Chemical Properties.—Of all the varieties of wheat cultivated in this country, that which is known by the name of the *White Dantzic* is said to be the best, and yields a larger proportion of flour than any other. After the operation of grinding, the flour, or farinaceous matter, is separated from the bran by sifting or bolting. It is inodorous, and nearly insipid. Water, with which it has been macerated, becomes milky or turbid; according to Dr. Thomson, it affords precipitates with infusion of galls and the strong acids, and rapidly becomes sour. If wheat-flour be made into a paste, and washed in a large quantity of water, it is resolved into three distinct substances; a *mucilaginous saccharine* matter, which is readily dissolved in the liquor, and may be separated from it by evaporation; *starch*, which is suspended in the fluid, and subsides to the bottom by repose: and *gluten*, which remains in the hand, and is tenacious, very ductile, somewhat elastic, and of a brown-grey colour. The first of these substances does not essentially differ from other saccharine mucilages. The second, namely, the starch, is particularly distinguished by its insolubility in cold water, but forms a transparent and gelatinous mass with that fluid when hot. M. Vauquelin found, that the flour which is used in Paris, consists of 72.8 parts of starch, 10.2 of gluten, 10 of water, 2.8 of a gummy kind of matter, and 4.2 of a sweet substance. Flour, kneaded with water, forms a tough, indigestible paste; but when a small portion of leaven or yeast, is added to the mass, it undergoes the panary fermentation, and produces bread, a small quantity of salt being added to give it sapidity. During the process, a large quantity of carbonic acid is evolved, but remains confined by the mass, in which it is expanded by the heat in baking, and thus raises the dough. This is the case of the porosity or sponginess of well-baked bread. When flour has been long kept, it becomes musty, and undergoes the putrefactive fermentation, in which state the bread made with it is very unwholesome. Flour is fit for making bread only when all its constituents are entire; and as gluten is the most susceptible of decomposition among them, the ascertaining its presence is a proof of the goodness of the flour. M. Taddei has taught us that guiaic is a test of the presence of gluten, by striking with it a beautiful blue colour; flour, therefore, which exhibits this colour when rubbed with guiaic and a few drops of vinegar, may be pronounced good.*

Bread purchased of the common baker is often unwholesome; it is generally highly fermented for the purpose of increasing its bulk, and it is almost constantly too little baked, lest it should decrease in weight; added to this, it is not always certain that the flour is free from pernicious adulteration. Mr. Accum, in his Treatise on Culinary Poisons, informs us, that the inferior kind of flour, which the London bakers generally use for making loaves, requires the addition of alum to give them the white appearance of bread made from fine flour. The baker's flour is very often made of the worst kinds of damaged foreign wheat, and other cereal grains, mixed in grinding the wheat into flour. The smallest quantity of alum that can be employed with effect to produce a white, light, and porous bread from an inferior kind of flour, he states to be from three to four ounces to a sack of flour weighing 240 lbs.

* *London Dispensatory, p.* 540.

" Another substance," continues Mr. Accum, " employed by fraudulent bakers, is subcarbonate of ammonia. With this salt they realize the important consideration of producing light and porous bread from spoiled or what is technically called *sour flour*. This salt, which becomes wholly converted into a gaseous substance during the operation of baking, causes the dough to swell up into air bubbles, which carry before them the stiff dough, and thus renders the dough porous; the salt itself is at the same time totally volatilized during the operation of baking." Potatoes are likewise, and perhaps constantly used by fraudulent bakers, as a cheap ingredient, to enhance their profit; and there are instances of conviction on record, of bakers having used gypsum, chalk, and pipe-clay, in the manufacture of bread.

Although the flour of wheat is better adapted for the purpose of making bread than any other kind of flour, there are many farinaceous vegetables, from the seeds or roots of which salutary and pleasant bread can be prepared. Oaten bread is common, not only throughout Scotland, but likewise in Lancashire, and several of the northern counties of England. In many parts of the former country bread is frequently made of barley meal, and pease meal; but the latter is dry, heavy, and difficult of digestion. In times of scarcity many attempts have been made to compensate for the want of corn, by the substitution of other vegetable substances, in the fabrication of bread. For this purpose recourse has been had to the herb *rag-wort*, the thick root of which, when dried and ground, yields a fine flour, which is said to be easily digested, and more nutritive than wheaten bread. The same properties and effects are attributed to radishes. From the acorn also a kind of meal is produced, which is said to make excellent bread, provided a little barley meal be mingled with it, to counteract its astringent qualities. In the wars of Westphalia, bread of this description was commonly used; and when made with milk was extremely pleasant and nutritious. The slightest preparation is sufficient to remove the harsh and disagreeable taste which the acorn has in its natural state. Roasting or boiling is all that is requisite to render it palatable. The acorns that are best calculated for this purpose are those of the white oak. A very good bread may be made of turnips boiled, and mixed with an equal quantity in weight of coarse wheat flour. Millet is sometimes used for the same purpose; and rice is converted by the Americans into a light, wholesome, and pleasant bread. Potatoes, mixed in various quantities with flour, make a wholesome, nutritive, and agreeable bread. M. Parmentier recommends the mixture of potatoes, in time of scarcity, with the flour of wheat, in preference to rye, barley, or oats; when no grain can be procured, he recommends the use of bread made from a mixture of the amylaceous powder of potatoes and their pulp, fermented with leaven and honey. Parmentier made bread very much resembling that of wheat, by mixing four ounces of amylaceous powder of potatoes, one drachm of mucilage extracted from barley, one drachm of the bran of rye, and half a drachm of glutinous matter, dried and powdered.

In the absence of any of the farinaceous vegetables which we have mentioned, various substitutes for bread have been employed in different parts of the world. By far the most valuable of these is the fruit of the Bread Tree, (Artocarpus *incisa*,) which grows abundantly in the South

Sea islands. The fruit is about the size of a child's head, covered with a thick tough rind. When used instead of bread, it is roasted either whole or cut into three or four pieces. In Iceland, Lapland, and other northern countries a kind of bread is made of dried fish, beaten first into powder, and then made up into cakes. In the lordship of Moscow, in upper Lusatia, a kind of white earth is found, of which the poor, in times of famine, have been compelled to make bread. Baron Humboldt informs us, that there are savages on the Oroonoko, who receive into the stomach large portions of potters clay; and in the western parts of Louisiana, the savage inhabitants are accustomed to eat great quantities of steatite, mixed with salt.

Starch. Wheat contains a larger portion of starch than any other source; but it is also obtained from other vegetable substances, particularly tuberous roots, in which it exists apparently in a state of mechanical mixture. They are rasped or pounded, and diffused through a large quantity of cold water: the fibrous parts are removed after they have been well washed, while the starch is mechanically suspended by the water and falls to the bottom. The potato contains about one-third of its weight of starch, and this is the substance from which it is usually prepared; but most vegetable substances yield more or less starch, when treated in the same manner as the potato. *Arrow-root* is merely a variety of starch, which is obtained by an analogous process from the root of the Maranta *Arundinacea*, a plant which is cultivated to a great extent in the West Indies. *Sago* is prepared in the same manner from the pith of various species of palms, and *tapioca* and *cassava* are obtained from the Jatropha *Manihot*, a South American plant. The substance commonly called *salep*, is also another variety of starch, and is prepared from the bulbs of the Orchis *mascula*.

Starch is a white, insipid substance; insoluble in ether, alcohol, and cold water, but forms a jelly with hot water. Alcohol, infusion of galls, the acetate and nitrate of lead, and some other metallic salts, precipitate it from its watery solution. Both acids and alkalies combined with water dissolve it. The strong acids decompose it, especially the sulphuric and nitric acids; the latter converting it into malic and oxalic acids. If starch be digested in twice its weight of water, and 1-50th part of sulphuric acid, renewing the water gradually as it is evaporated, and stirring it occasionally, it is almost entirely converted into sugar. When exposed to a moderate heat it begins to swell, and is gradually changed into a brownish substance, which is used in calico printing, commonly called *British gum*. According to MM. Gay Lussac and Thenard, 100 parts of starch consist of 49.68 parts of oxygen, 6.77 of hydrogen, and 43.55 of carbon. The most delicate *test* of starch is iodine, which renders its solution in water, even when largely diluted, of a fine blue colour.

Gluten. This is obtained, as already observed, by forming wheat-flour into a paste, and washing it repeatedly with cold water. It is a tough, elastic, fibrous substance of a greyish colour, and when dried semi-transparent, and much resembling glue. It has scarcely any taste, and bears a considerable affinity, both in its composition and properties, to the peculiar animal principle of the same name: it is dissolved by the acids and alkalies; the strong acids decomposing it at the same time.

Signor Taddei, an Italian chemist, has ascertained that the gluten of wheat may be resolved into two distinct proximate principles, which he has distinguished by the names *gliadine*, (from γλια, gluten,) and *zimome* (from ξυμη, ferment.) They are obtained by kneading newly prepared gluten in successive portions of alcohol, until it is no longer rendered milky by the addition of water. The alcoholic solution being allowed to evaporate spontaneously, a small portion of gluten is at first deposited, and the gliadine remains behind of the consistence of honey, and mixed with a little yellow resinous matter, from which it may be freed by digestion in sulphuric ether. The portion of the gluten not dissolved by the alcohol is the zimome. Gluten appears to be one of the most nutritive of vegetable substances; and wheat seems to owe its superiority to all other grains from its containing it in larger quantities.

Medical Properties and Uses.—Medicinally, bread is employed to form emollient poultices; and is frequently the medium for those active medicines which are given in very minute proportions, in the form of pills. Toasted and infused in water, it forms a grateful beverage for the parched mouth in fever; and is, or should be, the common drink of the dyspeptic. A solution of starch has been occasionally recommended as a demulcent for irritation of the fauces; but is now commonly used only for injections, when the rectum has been irritated or abraded by the passage of bile, or any of the acrid poisons, or as a vehicle for narcotic and other medicines in hypercatharsis.

Off. Prep.—Mucilago Amyli. L. E. D. Pulvis Tragacanthæ Comp.

SECALE CEREALE. *Cultivated Rye.* Plate 113.

Gen. Char. *Glume* of 2 valves, solitary, 2-flowered, on a toothed, elongated receptacle.

Spec. Char. *Valves* of the *glume* bordered with minute parallel teeth.

Syn.—Secale, *Ger. Em.* 68; *Matth. Valgr.* v. 364; *Camer. Epit.* 190.
Secale cereale, *Lin. Sp. Pl.* 124; *Willd. n.* 1.; *Pursh. v.* 1. 93; *Host. Gram. Austr. v. t.* 28.

Foreign.—*Seigle*, Fr.; *Segale*, It.; *Centedo*, Sp.; *Roggen*. Ger.; *Rag*, Swed.; *Rog*, Dut.; *Rosch*, Russ.

To render our illustration of Medical Botany as complete as possible, we judge it indispensable to give an original figure of the present species, and the diseased rye bearing Ergot.

Rye, we need scarcely observe, is a grain, much more generally cultivated in Britain in ancient than in modern times; being only partially used in certain districts for making bread, or in the distillation of spirits. Its native country is unknown; but Mr. Pursh says, it frequently occurs, apparently wild, in North America; flowering in June. The root is fibrous and annual; the stem is jointed, slightly branched at the bottom, smooth; the leaves linear, glaucous, rough towards the apex; spike terminal, solitary, erect, three or four inches long; glume containing two flowers, and consisting of two opposite, oblong, pointed valves, smaller than the corolla; florets sessile; corolla of two valves, the outermost ending in a long, straight, rough awn, four or five times the length of the glumes; filaments three, hanging out of the flower, with oblong, forked anthers; germen turbinate; styles two, reflexed; stigmas cylindrical, feathery; the fruit, and seed solitary, oblong somewhat cylindrical.

Poisonous Effects of Ergot.—Most of the knowledge, says Dr. John Thomson, which we at present possess respecting *chronic* or *dry gangrene* has been obtained from watching the progress of the disease, produced by eating *unsound rye*. This disease has seldom or never been observed in England, but is endemical in some districts in France, in which rye forms the principal food of the inhabitants. It occurs only, however, in those districts after very rainy or moist seasons; seasons in which that grain is liable to be affected with the particular disease, well known in France by the name of *ergot* or the *cockspur in rye*. Few years pass without the rye containing more or less vitiated grain; but in those years it is produced in such quantities as to form nearly one-fourth of the whole produce, It is in those seasons in which the ergot is most abundant that the mortification makes its appearance, and it has from this circumstance been naturally inferred, that this disease in the rye was the cause of the mortification.

The attention of the public was first called to this disease, in a particular manner, by M. Dodard, by a letter inserted in the Journal des Savans for the year 1676. In this letter he mentions, that it had been long known that those who made use of rye bread, containing much of this corrupted grain, were liable to be affected in their extremities by a gangrene, attended usually with but little fever, inflammation, or pain, but during which the use of the limb affected was destroyed, or the limb itself became dead, and separated from the body. The part became at first insensible and cold, and in the progress of the disorder, dry, hard, and withered. In very malignant cases M. Dodard mentions, that this mortification was attended with a greater or less degree of delirium. The account which this author gives of the symptoms and

progress of this disease is evidently imperfect, and the only fact stated in his relation, which seemed decidedly to prove that the mortification was owing to the use of corrupted rye, was, that the grain proves fatal to fowls that are fed with it. M. Saviard mentions having seen this distemper in the year 1694, at the Hotel Dieu of Orleans. He contents himself with observing, that it is very frequent in Sologne; that it attacks those who eat rye affected with the cockspur; and that the upper and lower extremities of the patients, whom he saw, grew, during the progress of this affection, as dry as touchwood, and as emaciated as Egyptian mummies.

In the year 1710 several accounts of this disease were transmitted to the Royal Academy of Sciences at Paris, by gentlemen practising physic and surgery in the districts in which it was known that season to have prevailed. In particular M. Noel, surgeon to the Hotel Dieu at Orleans, mentioned to the secretary, that about thirty people, men and children, affected with a dry, black, and livid gangrene, had come that season into the hospital; that this affection always began in the toes, and extended itself gradually along the foot and leg, till it sometimes rose to the upper part of the thigh; and what is a singular observation, and one peculiar to himself, that he had not seen any female afflicted with this distemper, and had only in one case seen it affect the upper extremities. In some patients the gangrened part came away of its own accord; in others it became necessary to use scarifications and other topical remedies. In four or five instances death succeeded to amputation, because, notwithstanding the performance of that operation, the disease continued to extend to the trunk.

The history of one case was communicated to the Academy, in which the lower extremities were separated from the body, in the articulation of the heads of the thigh bones with the *acetabulum*. The example of this and of other cases in which these cavities were in the process of the cure filled up with new and sound flesh, is what probably suggested the operation of amputation at the hip joint.

It is particularly mentioned in this report, that this gangrene attacks only the poor and ill fed of the districts in which it occurs. The rye of Sologne, in the year 1709, contained, according to the relation of M. Noel, fully one-fourth of the cockspur; and the poor had taken no pains to separate it from the good grain with which it was mixed. The same M. Noel, in a letter which he addressed many years afterwards to M. Quesnai, seems to be of opinion, that the diseased rye lost its malignant quality after a certain time; this period he limited to two or three months; but this opinion is not exactly confirmed by subsequent observations. During the thirty-three years in which M. Noel had been surgeon to the Hotel Dieu of Orleans, that distemper had appeared three or four times, and always in those rainy seasons in which rye contained a large proportion of the cockspur. The disease in his patients had always existed for some time before those patients applied at the hospital for relief; so that he could not give any very accurate information from his own observation of the symptoms which manifested themselves; but he adds, that these unfortunate patients had often told him, that the disease generally began in one or both feet, with pain, redness, and a sensation of heat as burning as the fire; and that at the end of some days these symptoms ceased as quickly as they had come

on, when the extreme sensation of heat which they formerly felt was changed into cold. "The part affected," adds M. Noel, "was black like a piece of charcoal, and as dry as if it had passed through the fire." After some time a line of separation was formed between the dead and living parts, like that which appears in the separation of a slough which has been produced by the application of the cautery, and the complete separation of the limb, was, in many cases effected by nature alone; in others he had recourse to amputation, which he found to prove sufficiently successful, unless in those patients who were very much worn out with the disease, or who had naturally very bad constitutions.

This disease appeared in Switzerland in the years 1709 and 1716; and a very accurate description of its symptoms and progress in that country has been given by Langius, a native of Lucern, in a Dissertation, entitled, "Descriptio Morborum ex usu Clavarum Secalinarum."

M. Gassond, physician in Dauphiny, where this disease had appeared also in 1709, says, that many of the people were affected with swellings of the feet, legs, hands, and arms, which degenerated into a gangrene that penetrated to the bone, and produced a separation of the affected limb; and which often required no assistance on the part of the surgeon, except to correct the deformity which it sometimes left behind. This gangrene was attended with different symptoms in different individuals; some suffered very violent pain, accompanied with insufferable heat, although the part affected felt cold to the touch. In other patients, redness, with much swelling, supervened, attended by delirium and fever. Others were without these symptoms, though they suffered equal pain. In some patients the parts affected became withered, dry, and black like charcoal. The separation of the dead parts from the living took place with the most excruciating pain, and a sensation resembling that produced by the direct application of fire to the body. This sensation was sometimes intermittent, and in other instances it was succeeded by an equally harrassing sensation of cold.

M. Bossau, surgeon to the hospital of St. Antoine in Dauphiny, has remarked some peculiarities in the history of this disease which are worthy of notice. This author says, that the gangrene which he had the opportunity of observing, was not in every instance of the dry kind, but that the limb attacked with it sometimes became putrid, worms or maggots were generated, and a most insupportable stench exhaled; that these symptoms were not the same in every patient, but that they had this in common, that heat and cold were equally insupportable, that the disease was not communicable by infection, that it attacked indiscriminately men, women, and children, that there were now about four hundred parishes attacked with this disease, each of which contained six or more patients, and that between thirty and forty came to the Hospital, upon whom it was judged necessary to perform amputation of the arms or legs.

The degree of fatality attending the progress of this mortification in different districts appears to have been very various. M. Duhamel mentions, in the Memoirs of the Royal Academy for the year 1748, that of one hundred and twenty persons attacked, scarcely four or five had escaped with their lives. Langius mentions, that it was equally fatal in Switzerland. A calamity so serious, and recurring so often,

would not fail to attract attention, and stimulate the curiosity of medical men; and accordingly we find, that in France many attempts were made to discover the true source from which it proceeded. In attending to this subject it was soon observed, *that animals of every kind, except man, refused to eat rye affected with the cockspur;* and that many of them would rather starve, than taste bread or food of any kind, into which a portion of it had, for the sake of experiment, been introduced. Animals that were found to swallow it were observed to die of gangrene, which, in different animals, attacked different parts of their bodies. The observation of these facts, and the results of several trials made with the corrupted rye, seemed to leave no room for doubt with regard to the true origin of this disorder; but in the discussion of many of the questions relative to this disease, doubts began to be entertained by some, and experiments were made by a number of individuals to prove that the disease had its origin in other causes.

M. Model, a Russian apothecary, from some experiments, which are detailed in the thirteenth volume of Bomare's "Dictionnaire d'Histoire Naturelle," was led to conclude that rye, vitiated with cockspur, does not possess the quality of exciting gangrene in animals. He fed for some time hens, pigeons, and dogs, with food containing a portion of diseased rye, without observing any injurious effects to result; and this emboldened him to try the use of it on his own person. But the quantity of this substance which M. Model administered, or which he took himself, was greatly inferior to what the people inhabiting the countries where the disease prevails, consume of corrupted rye in ordinary years, without being at all injured by it. His opinion, however, having been eagerly adopted by some men of great reputation in France, such as Parmentier, Schlegel, and Tillet, it became necessary to bring its truth to the test of a fair trial, and to make such experiments upon this subject as should leave no further room for doubt or uncertainty. The Royal Society of Medicine in Paris employed M. Tessier to go into the countries where this gangrene prevailed, to collect a sufficient quantity of the cockspur rye, and to institute such experiments as seemed best calculated to determine so important a point. The result of M. Tessier's observations and experiments are to be found in two Memoirs, inserted into the first two volumes of the Memoirs of the Society by which he was deputed. The first contains an account of all the facts which he could learn respecting the production of the cockspur in rye; and the second an account of the results which he obtained, by feeding a number of animals with that substance. Some of those results are sufficiently curious to be deserving of particular attention. M. Tessier had learned in Sologne, and in the other districts of France, where this species of gangrene appears, that the inhabitants eat rye with impunity for three or four months together, one-fourth part of which consists of cockspur; and this fact served him as a guide in judging of the quantity that would be necessary to mix with the food of animals, which he had chosen for the subject of his experiments.

His first experiment was made on two wild ducks, male and female. He fed them with food containing one-seventh part of corrupted rye, and increased the corrupted rye till it formed one-ninth. At the end of the fifth day, drops of a very black coloured fluid were seen to

ooze from the nostrils of the duck. By this time she had taken about an ounce and two drachms of cockspur rye. The tongue had become yellow, swollen, and flabby. The beak became first brown, and then black, particularly towards the root. The skin covering it swelled and became cold, as well as the tongue, the point of which became also pale and sphacelated. The parts affected began to emit a bad smell, and the bird died between the ninth and tenth day of the experiment. During that period it had taken an ounce and seven drachms of ergot.

The drake was not sensibly affected before the eighth day, nor till it had taken eleven drachms of the poison. In this bird the tongue did not sphacelate, but the other symptoms were nearly the same as in the duck. Death took place on the fourteenth day, after two ounces and six drachms had been taken. On dissection, no marks of gangrene or inflammation could be discovered in the course of the alimentary canal.

The third experiment was on a turkey hen. She was seized with vertigo; her head assumed a violet colour, and the nostrils emitted a reddish coloured liquor. A diarrhœa came on, and she died on the twenty-second day. Marks of inflammation and gangrene were found in different parts of the alimentary canal. Gangrene had also attacked different parts of the body.

Experiments on pigs led also to results of a similar nature.

These experiments appearing to be sufficient to establish the injurious effects of the cockspur rye, when used as an article of food, M. Tessier made a number of curious experiments to ascertain the degrees of aversion which animals show for this substance, either alone, or mixed with the substances with which they are usually fed. In all his trials he found it extremely difficult to disguise the rye so as to induce the animals to swallow, voluntarily, any portion of food into the composition of which the ergot was introduced.

These experiments of M. Tessier's, in confirming the opinions of those who believed that the use of this substance was the cause of those gangrenous diseases, which had repeatedly appeared as endemical in various districts of France, afforded also a simple explanation of the fact, that persons might live for a considerable time upon rye affected with the cockspur, without suffering any sensible injury from its use; since, in all the animals upon which it was tried experimentally, a given quantity was required to produce the specific effect; and they suggested the only measure, that of separating the diseased from the sound rye, which could prevent so great a national calamity, as that which had been so often produced by its use.

The spurred rye occasionally occurs in this country, but there are no instances recorded of its producing any such effects as those enumerated above; but in the Philosophical Transactions Dr. Wollaston has narrated several cases in which dry gangrene was produced in one family, by partaking of damaged wheat: the following was the result, at the time the paper was published:—"Mary the mother, ætat. forty. The right foot off at the ankle: the left leg mortified, a mere bone; but not off.

Mary, ætat. fifteen. One leg off below the knee: the other perfectly sphacelated, but not yet off.

Elizabeth, ætat. thirteen. Both legs off below the knee.
Sarah, ætat. ten. One foot off at the ancle.
Robert, ætat. eight. Both legs off below the knees.
Edward, ætat. four. Both feet off at the ancles.
An infant, four months old, dead.
The father escaped by merely losing two fingers.

The wheat used, was what is called in Suffolk, where the family resided, "rivets," or "bearded" wheat.

Nearly the same effects were produced in a family in Wiltshire, by the Lolium *temulentum*, entering largely into the composition of bread; for an account of which we refer to No. 1. of our work.

Qualities and Chemical Properties of Ergot.—The true nature of ergot has not hitherto been fully ascertained, notwithstanding the research and talent that have been brought to the investigation. Some have observed a viscid, fermenting juice in the glumes, previously to the formation of the ergot; while others have detected small larvæ, which being preserved, have afterwards hatched into moths or butterflies. The Abbé Fontana planted in his garden a number of single grains of wheat and rye, and upon the top of each placed several grains of ergot. The result was, a crop in which both the wheat and rye were infected with ergot; which experiment indicates something like contagion in the disease, which may very possibly take place through the agency of insects.

In an Essay on the genus Sclerotium by De Candolle, in the "*Mémoires du Museum d'Histoire Naturelle*," the ergot is stated to be a parasitic production belonging to this genus, which he calls Sclerotium *clavus;* by other Botanists it has been named Acinula *clavus* and Sphacelia *segetum*, while many persons, notwithstanding De Candolle's researches, consider the result of his investigation as by no means satisfactory; and contend that ergot is a diseased modification of the grain of the rye itself.

The most satisfactory accounts we possess of the nature of ergot is that given by *M. Léveillé*, who states, that the ergot consists of two parts:—first, the *spur*, properly so called, which is merely the abortive and degenerately developed germen, which part is inert; and secondly, of a small deliquescent fungus growing on the summit of the spur, and which he

calls *sphacelia*. This is easily washed off by heavy rains, which circumstance will readily account for the very different states of activity of ergot as a medicine, and the very variable effects of ergotised grain when taken as food.

Spurred rye, in its native state, is of a violet or brownish colour. Its size is very variable, some grains being less than healthy rye, and can scarcely be perceived in their husks, whilst others are from one inch to an inch and a half in length, and of a proportionate thickness. The spur is nearly cylindrical, having its ends somewhat obtuse, at times a little pointed, and bent a little in the shape of a crescent. But there is a great variety in this respect, although in all the shape is more or less *monstrous*. They have generally a longitudinal depression or two running from end to end. Some grains have cracks, apparently from dryness; and others small cavities, perhaps the bites of coleopterous insects. On being broken transversely, they snap like dried almonds; and internally display a greenish-white substance, closely covered by the coloured cortical part, which does not separate from it on ebullition. Viewed through a microscope, this fracture presents in its centre an appearance of white brilliant grains like starch, and towards the circumference a violet shading besprinkled with minute whitish spots. When reduced to a powder it is of an ash-grey colour, and is very dry. If quite fresh, spurred rye is of a disagreeable sickly odour. A certain quantity, after having been kept for some years in a close box, contracted the smell of putrid fish. It was also of a black colour, and almost all the grains were in a degree worm-eaten, with little of substance left except the cortical part, so that it was quite friable to the touch. However, no other traces of insects could be discovered about them. When snuffed up into the nostrils it produces a slight degree of irritation, like a small pinch of powdered tobacco, occasioning a tendency to sneeze, and a pretty abundant secretion of mucus. In the grain, and quite dry, spurred rye has scarcely any taste, and, on being chewed, leaves in the mouth a slight acrimony. But in the powder its taste is nauseous, bitter, and acrid, like that of corn when in a state of decay.

On kneading, with warm water, the flower of rye affected with the spur, a fetid disagreeable smell is very perceptible. The paste is not adherent, and the bread has neither the consistence nor smell of the common rye bread.

Parmentier, who had some made with flour, containing one-third of spurred rye, asserts that the bread was quite inodorous, and only slightly bitter. However, it may easily be conceived, that the qualities of such bread must vary according to the greater or less quantity of the spurred rye entering into its composition, which in a natural way can scarcely ever equal that formed by Parmentier. According to Vauquelin, spurred rye yields by analysis a yellowish-fawn coloured matter, soluble in alcohol, exhaling a smell like that of fish oil; a white oily matter of a bland taste; a violet coloured matter, insoluble in alcohol; a free acid, which appears to be of the nature of phosphoric acid; a vegeto-animal matter in considerable quantity, much disposed to putrefaction, and which on distillation furnishes a considerable quantity of thick ammoniacal oil; a minute quantity of ammonia, exhaling at the temperature of boiling water. It also appears from the result of the same analysis, that rye in its spurred state no longer contains any starch; that its gluten has been altered, and that it abounds with a thick ammoniacal oil, which is never to be met with in rye when in its sound state. The same chemist, wishing to clear up an important point, has made a comparative analysis of another species of Sclerotium, viz. S. *stercorarium;* by means of which he obtained results so totally different, that he has been led to consider De Candolle's opinion to be erroneous; but it is evident that no satisfactory conclusion can be drawn from the comparative analysis of two plants of acknowledged difference in species; and probably belonging to distinct genera.

Pottehnhoffer, is said to have demonstrated in 1819, the existence of *morphine* in spurred rye; and it is not improbable, but that future analyses of this curious production will lead to the discovery of an active principle, *sui generis*, on which its virtues as a medical agent depend. The latest analysis is that of *M. Maas*, of Hamburg, who states, that ergot contains

gluten, ammonia, or a peculiar alcali, acetic acid, colouring matter of a violet hue, resin, fixed oil, and an alcaline acetate; but neither starch, nor hydrocyanic acid, nor narcotine, nor phosphoric acid, as other chemists have supposed.

Medical Properties and Uses.—No notice occurs of spurred rye as a uterine remedy till 1688, when Camerarius stated, that the women in certain parts of Germany were in the habit of employing it to accelerate parturition. From that period till 1774 no author had made mention of its being used; and it was only then that a very brief letter from Parmentier to the editor of the *Journal de Physique*, made known that it was frequently given as a child-bed remedy by Madame Depelle, a midwife at Chaumont, in the Vexin. But this letter, which is a mere announcement of the fact, contained no other information. It was reserved from M. Desgranges to make known more fully the singular property of ergot. Having met with several midwives in 1777, both in Lyons and its environs, who, from a traditionary knowledge, were accustomed to employ it with no little mystery, he at length made trials of it, which for the most part were crowned with success. He published, at different times, and in various journals, the results of his practice, and specified the peculiar circumstances which admit, or contra-indicate the employment of this remedy. It is, therefore, to the zeal and knowledge of Desgranges that the world is indebted for the precise acquaintance of this valuable remedy, which he propagated with all his talents, against the strongest prejudice. When this discovery was first announced, it was only employed in the department of the Rhone and some of the frontier departments. Soon after, its use began gradually to spread from various points throughout the kingdom, as may be proved by the number of cases published since in periodical works, by practitioners in the different departments. According to Dittmer, it is also used in different countries in Germany, and particularly in the environs of Ludwisbourg, in Wirtemberg, where it is principally in the hands of the midwives, who give it usually to be swallowed whole in its natural state, administering either

five or nine grains for a dose, but always in odd numbers. At Florence, also, as well as in other parts of Italy; and in America, this substance appears to be held in as much estimation as any article of the materia medica. And it is a singular fact, and well worthy of our notice, as tending to establish its claims, that its property of acting specifically on the uterus was first announced to the public of America by Dr. Stearns of New York State, in 1807; who, according to a statement by Dr. Bigelow, published in No. 2, vol. 5. of the New England Journal of Medicine and Surgery, was ignorant of its ever being so employed in Europe: "The use of this article in medicine," says Dr. Bigelow, "is, to the best of our knowledge, an exclusively American practice, and if it is now introduced into any part of Europe, it must be from the publications of this country."

Like all other powerful remedies, the use of ergot might inadvertently be abused. It is therefore necessary to lay down some general rules for its administration.

(1st.) It must never be given when there is malformation of the bones of the pelvis, or of the soft parts of the mother, capable of opposing any remarkable obstacle to the passage of the fœtus. If the dimension of the pelvis be less than three inches and a half between the pubes and sacrum, the expulsion of a full grown fœtus will be very difficult; in which case the *ergot*, by exciting strong uterine contractions, without overcoming the mechanical obstacle, might produce rupture of the uterus itself; and in a case that a few years ago occurred in the vicinity of London, it is very evident that the disproportion between the size of the child's head and the pelvis should have prevented the medical attendant from employing this powerful agent. A similar inconvenience might result too, if the passage were obstructed by any large tumour, or by any excessive rigidity of the orifice or sides of the vulva.

(2d.) The os uteri should be supple and yielding, and partly dilated; and the time of parturition should have decidedly commenced, or already existed for some time.

(3d.) It must not be used so long as the natural pains are effi-

cient, and competent to the end; for art should never precede nature in hastening the natural act of delivery.

(4th.) The fœtus should be presenting in such a manner as to be expelled naturally; there being no necessity to change its position; nor should its bulk be too great for the natural passages. If it be, the ergot cannot with propriety be employed till that bulk be reduced.

(5th.) If the labour be accompanied by flooding, convulsions, syncope, &c. it may be sometimes employed with great advantage, provided the membranes are ruptured and the os uteri dilated.

(6th.) It may be used very often with much advantage in every kind of premature labour; and at full time, when the placenta is not thrown off, and the uterus is found in a state of atony.

(7th.) When flooding takes place after the rupture of the membranes; the os uteri well dilated; the pains feeble, but the child well situated.

(8th.) When the head of the child has been left in the uterus, by being separated from the body.

(9th.) When the uterus is painfully distended with coagula.

The ergot powdered is the most simple of the preparations, and its properties are most apparent in proportion to its freshness and fineness. The dose usually given is from ten to sixty grains, and even more, during the labour, in a small wine-glass full of barley water, capillaire and water, cinnamon water, or other convenient vehicle. As we must for the most part be ignorant to what extent this substance may act, and as there might arise much inconvenience in hurrying a labour too much, we ought never to exceed twenty grains for the first dose; and even this had better be given in two proportions, with a short interval between their administration. But if at the end of an hour, it should produce no apparent effect on the uterus, we may give a scruple for a dose; and should it become necessary to administer it a third time, we may then give thirty grains. It may be easily imagined, that the manner of giving the spurred rye may vary infinitely; and that what we have advanced on this subject is far from constituting an invariable rule;

as the ergot may be prescribed in different ways according to the circumstances of the patient, and the particular views of the practitioner. We ought however to observe, that when given in doses too small, it only produces very weak muscular contractions of the womb, which serve to fatigue and wear out the strength of the patient instead of inciting that organ to expel its contents.

The *infusion*, or *tea of black rye* of the American practitioners, is made by infusing a drachm of the powder in a wine-glass of boiling water, till cold. To this preparation many persons give the preference, and administer half the quantity at the interval of an hour. Some persons boil the same proportions for a quarter of an hour, and this constitutes the *decoctum parturiens* of some writers.

M. Villeneuve, and many others, recommend the ergot to be administered in *lavements*, whenever there is too much susceptibility of stomach, nausea, or vomiting, and repugnance on the part of the patient to swallow it. It is of course given in this manner in much larger doses, two or three drachms being boiled in half a pint of water; and administered at intervals as may be necessary.

The action of the ergot appears to be specifically upon the uterine fibres; urging them sooner or later to more or less violent contraction. It is not the alternate contraction alone that is increased by this substance; the tonic, which is of much more value, is also powerfully augmented; since it can, in consequence of this power, be most advantageously employed, in many cases where this effect is all-important. In this respect it appears different from other stimuli, which may exert an influence upon this organ; such as opium, volatile alkali, &c.; or the mechanical stimulus of the forceps, vectis, or the hand. Dr. Dewees states, that he never witnessed any exaltation of the power of the arterial action from the exhibition of ergot, which is contrary to our own experience; as in several cases in which we have tried it, it has increased the fulness and frequency of the pulse; produced a glow of skin; and it has also been known to excite nausea, vomiting, and vertigo.

Each of the stimulants just referred to has been known to rouse the feeble contractions of the uterus into a temporary, and sometimes successful action; but by neither is the tonic contraction roused, with any degree of certainty; on the contrary, inertia of this organ is very apt to follow their employment. Thus hæmorrhage sometimes succeeds the use of either of the remedies just named; but extensive inquiry will justify the declaration that no such consequence arises from ergot. A very remarkable fact, is, that spurred rye does not appear to exert any very decided action upon the uterus, excepting when that organ has already put on the disposition to expel its contents. The experience of many years proves this important fact; and it will be found on investigation that amongst the many accidents that are said to arise from its use in bread, that no mention is made of abortion or premature birth, as its immediate effect. We therefore consider this as a settled point, strengthened as it is by the knowledge, that it is familiarly used near Lyons to aid the parturient cow; France being the country in which the most ingenious methods are employed to accomplish this object; the desire for which, however urgent, proves a refined depravity, from the stigma of which England is happily free.

It is a singular fact, that the Chenopodium *olidum*, which has been proved by Mr. Houlton, and subsequently in our own practice, to have a *direct* action as an emmenagogue, agrees in its sensible properties with those of the ergot; and to preserve the particular odour of the latter, it is absolutely necessary that it should be kept whole in a glass bottle with a ground stopper, and only powdered when required for use; nor should it, if possible, be used when it exceeds a year in age; for, like every other vegetable substance, it is easily acted upon by heat and moisture; and its producing no effects in the practice of some can only be accounted for by its being effete; a circumstance of no uncommon occurrence, especially in this country.

In a case of profuse hæmorrhage which lately occurred in our own practice, we found the membranes entire, the so uteri dilated to the size of a crown-piece, attended by complete inertia of that organ. On examination, the placenta was not to be found

within reach: we therefore discharged the liquor amnii, but without arousing the expulsive efforts. We then had recourse to scruple doses of ergot, given at an interval of ten minutes, and fore a quarter of an hour had elapsed the pains came on, the hæmorrhage ceased, and the child was soon expelled; the placenta followed in due time, and no untoward symptom ensued.

HORDEUM VULGARE.—*Common Barley.*

GEN. CHAR. *Glume* lateral, 2-valved, single-flowered, ternate.

SPEC. CHAR. *Flowers* all perfect, awned; two of the rows more erect than the rest.

Syn.—Hordeum polystachium verum, *Ger. Em.* 70.
Hordeum vulgare, *Lin. Sp. Pl.* 125.; *Errh. Pl. Offic.* 421.; *Lob. Icon.* 28.; *Host. Gram. Austr. v.* 3. 35.

FOREIGN.—*L'orge avancé*, Fr.; *Orzo*, It.; *Cebada romana*, Sp.; *Gemeine Gerste*, Ger.

NEXT to wheat, the most valuable grain is barley. It is an annual plant, and is said to have been found wild in Sicily and Russia. The flowers are disposed in four rows, on a common receptacle or main stalk, which is elongated into a long, flat, jointed spike or ear. The *glume*, or outer chaff, consists of two narrow, pointed valves, one half shorter than the inner or *glumella*, each containing a single sessile flower; the glumelle or inner chaff is ovate, concave, and terminates in a very long, flat, serrated awn or beard. The filaments are capillary, shorter than the glumelle, with notched anthers. The germen is ovate, channelled, and firmly coated with both valves of the glumelle.

This is the barley most generally cultivated; but Hordeum *distichon*, two-rowed barley, is the species admitted into the Dublin Pharmacopœia, from which the pearl barley of the shops is said to be principally prepared.

Barley is used in some countries for making bread; but it is chiefly cultivated here for the purpose of forming malt liquors, or distilled spirits. To prepare *malt*, barley is the grain usually employed. It is steeped for two or three days in water until it swells, becomes tender, and imparts its colour to the liquid. The water is then withdrawn, and the grain is spread out on the floor to the depth of two feet, where its temperature rising spontaneously, it begins to germinate, bursting, and shooting out the radicle. This process is soon stopped by spreading the grains over a large surface, and turning them repeatedly, which is continued for two days; after which, they are again made into a heap, and allowed to remain in this state till they turn warm, and are then dried in a kiln by a gentle heat. *Beer* is made from malt previously ground by a mill. This is put into a large vessel or tub with a false bottom, termed the mash-tub; hot water is poured upon it, and the whole stirred up at intervals. The temperature of the water in this operation, called Mashing, must not be equal to boiling; for, in that case, the malt would be converted into a paste, from which the impregnated water could not be separated. This is called Setting. After the infusion has remained for some time upon the malt, it is drawn off, and is then distinguished by the name of sweet wort. By one or more subsequent infusions in water, a quantity of weak wort is made, which is either added to the foregoing, or kept apart, according to the intention of the operator. The wort is then boiled with hops, which gives it an aromatic, bitter taste, and renders it less liable to be spoiled in keeping; after which it is cooled in shallow vessels, and suffered to ferment, with the addition of a proper quantity of yeast. During the fermentation, an internal commotion takes place in every part of the liquor, caused by the extrication of gas, raising to the surface a quantity of yeast, in which the air bubbles are enveloped. After this fermentation has continued a certain time, and the herd does not seem likely to rise any higher, it is necessary to put a stop to it, as it would be succeeded by the acetous fermentation; this being called the vinous, producing alcohol or spirit. This is performed by drawing off the beer, and putting it into small casks, where it continues to ferment, and discharge yeast for some time, the casks being filled up as they diminish in their contents. When the working ceases, the casks are bunged up, and the beer is set aside for table. The strength and quality of the liquor differs greatly according to the nature of the grain, the particular substances that have been added to flavour it, the length to which the fermentation is allowed to proceed, and the various manipulations which are adopted by different manufacturers, both in the preparation of the malt, and in the subsequent processes.

Pearl barley is prepared in Holland and Germany, by first moistening and shelling the grains, and then grinding them into round granules,

in a mill. Pearl barley consists principally of starch, with a small portion of gluten, mucilage, and saccharine matter.

Uses.—Barley bread is much used by some northern nations; but it is less nutritious than that prepared from wheat or rye. The decoctions of barley, barley water, and barley broth, are well known. The former is much employed as an agreeable and wholesome nourishment for the sick, and barley water, acidulated with the juice of lemons or oranges, forms one of the most salutary beverages in febrile diseases. Sweet wort was formerly much used as an antiscorbutic in the navy; and a cataplasm of yeast, with barley meal, or ground malt, is sometimes employed as a stimulant and antiseptic, to foul spreading ulcers and gangrenous parts. When properly fermented, of a moderate strength, and used within the limits of propriety, malt liquors are refreshing, wholesome, and considerably nutritive. It is a common observation, that those who drink sound malt liquors are stronger than those who drink wine; and to those who are trained to boxing and other athletic exercises, home-brewed beer is particularly recommended. Hence Jackson, the celebrated trainer, affirms, that if any person accustomed to drink wine would try malt liquor for a month, he will find himself so much the better for it, that he would soon take to the one and abandon the other. Malt liquors are divided into small beer, strong beer, ale, and porter. Small beer, and the weaker ales, are refreshing, gently stimulant, and nutritive drinks. Porter, and the stronger ales, are exceedingly nutritious, and strengthening when used within the limits of sobriety; but these liquors can seldom be procured genuine when purchased in small quantities, at least in London.

Off. Prep.—Decoctum Hordei L. E. D. Decoct. Hordei Compositum, L. D.

AVENA SATIVA.—*Common Oat.*

GEN. CHAR. *Glume* 2-valved, many-flowered; with a twisted awn on the back.

SPEC. CHAR. *Inflorescence* panniculed; *glumes* 2-flowered; *fruit* very smooth, 1-awned.

Syn.—Avena, *Camer. Epit.* 191; *Fuchs. Hist.* 185.
Avena sativa, *Lin. Sp. Pl.* 118; *Willd.* i. 443.
FOREIGN.—*L' avoine cultivée*, Fr.; *Tuttenhaver*, Ger.

THE Oat was found by Anson growing wild upon the island of Juan Fernandez, but no one has been able to ascertain satisfactorily the place from whence it was first brought to Europe. The root is an annual, sending up a culm or straw, about two feet in height. The inflorescence is in a loose panicle, with the subdivisions on long pendulous peduncles. The two glumes or outer chaffs are marked with lines, pointed, unequal, and longer than the flower. There are usually two flowers and seeds in each glume; they are alternate, conical, the smaller one is awnless, the larger puts forth a strong, two-coloured, bent awn, from the middle of the back. Of this grain, the varieties are more numerous than any other of the culmiferous tribe; but in this country, that which is called the *potato oat*, is considered the best.

QUALITIES.—M. Vogel could detect no gluten in oats; but he obtained an azotized substance, destitute of elasticity, and having no resemblance to gluten. Oats contain, besides fecula or starch, a saccharine matter, a bitter principle, and a fixed oil, of a yellowish green colour.

USES.—The flour or meal made into cakes and pottage, is the common food of the country people in the north. Grits, or groats, are oats freed from their cuticle, are much used in making broths and gruels. They are wholesome and gently laxative. Gruel is prepared by boiling, either the meal or grits, for a

proper length of time, in water. The purest and most convenient form is, however, that which has been perfected in its manipulations by Mr. Robinson, whose patient groats are superior to any others we have seen. It is moderately nutritive, and demulcent, hence it is frequently prescribed in inflammatory diseases, diarrhœa, cholera, dysentery, and other diseases. The meal, boiled in water, forms an excellent suppurative poultice.



Cochlearia Armoracia.

CXIV

COCHLEARIA ARMORACIA.

Horse-radish.

Class XV. TETRADYNAMIA. *Order* I. SILICULOSA.

Nat. Ord. SILIQUOSÆ, *Lin.* CRUCIFERÆ, *Juss., De Cand, &c.* BRASSICACEÆ, *Burn.*

GEN. CHAR. *Pod* emarginate, turgid, rugged, 2-valved. *Seeds* several.

SPEC. CHAR. Radical *leaves* oblong, crenate; those of the *stem* lanceolate, either cut or entire.

Syn.—Raphanus rusticanus, *Raii Syn.* 301; *Ger. Em.* 241, *f.*; *Matth. Valgr. v.* 1. 401. *f.*; *Camer. Epit.* 225.

Raphanus sylvestris, *Fuchs. Hist.* 660. *f. t.* 379. *f.*

Nasturtium n. 504. *Hall. Hist. v.* 1. 218.

Cochlearia Armoracia, *Lin. Sp. Pl.* 904; *Willd. v.* 3, 451; *Fl. Brit.* 690; *Eng. Bot. v.* 33. *t.* 2323; *Woodv. t.* 150.

FOREIGN.—*Cranson de Bretagne; Raifort Sauvage; Moutarde des Allemands*, Fr.; *Rafano rusticano*, It.; *Marvisco*, Sp.; *Murrettich*, Ger.

HORSE-RADISH is a perennial plant, growing naturally by the sides of ditches, on the banks of rivers, and in waste grounds, from the refuse of gardens. It has long been received into our materia medica, and was cultivated in Britain in the time of Gerard, who says, "Horse-radish for the most part groweth, and is planted in gardens, yet have I found it wild in sundrie places, as at Namptwich in Cheshire, in a place called the Milne Eye, and also at a small village near London, called Hogsdon, in the field next vnto a farm house, leading to Kingsland, where my verie good friend Master Bredwell, practitioner in physick, a learned and diligent sercher of symples, and Master VVilliam Martin, one of the Fellowship of Barbers and Chirurgians, my deere and louing friende, in company with him, found it, and gaue me knowledge of the place where it flourisheth to this day." The specimen from which our figure was taken, grew by the side of the Thames, between the Red-House, Battersea, and

Putney Bridge, where it was also found many years ago by Sir J. E. Smith, and figured in "English Botany," t. 2223. It flowers in June; but rarely perfects its seeds.

The root so well known at table as an accompaniment of the roast beef of Old England, is long, white, cylindrical, strikes deep into the earth, and is extremely difficult of extirpation. The stem is round, erect, branched, and rises about two feet high. The radical leaves are petiolate, very large, dark green, oblong, obtuse, veiny, crenate, waved, and occasionally pinnatifid: those of the stem are scattered, much smaller, sessile, lanceolate, sometimes serrated or toothed, and sometimes entire. The flowers are numerous, white, and terminate the stem in dense clusters. The leaves of the calyx are ovate, concave, spreading, and deciduous; the petals obovate, twice the length of the calyx, and inserted by narrow claws. The filaments are awl-shaped, incurved, the length of the calyx, and bearing heart-shaped anthers. The germen is oblong, surmounted with a short style, and a large capitate stigma, changing into an elliptical, compressed, notched, bilocular pod, containing about four seeds in each cell, most of which prove abortive.—Fig (*a*) represents a flower, with the calyx and petals removed; (*b*) the germen; (*c*) the pod.

Culture.—The Horse-radish is generally propagated by cuttings, and requires a rich deep soil, in order to induce the plants to strike their roots freely. "Crowns," says Mr. Neill, "having about two or three inches only of root attached to them make very good plants; but cuttings of the knotty parts of the roots, provided always they be furnished with one or two buds or eyes, are often preferred, as they are to be planted entirely under the soil. They are generally planted in February or March, in lines, leaving a foot and a half between each line. The sets are placed at the depth of at least a foot if the soil be light, fifteen inches is not too deep. The roots are not dug for use till the second year; and they are raised only when wanted, the pungent quality escaping rapidly as the root dries."

Qualities.—The root has a pungent odour, and a warm acrid taste, with a degree of sweetness. Both water and alcohol extract its virtues. By drying, it loses all its acrimony, becoming at first sweetish, and afterwards nearly insipid; if kept in a cool place, covered with sand, it retains its pungency for a long time. It yields, by distillation with water, a pale yellow-coloured, acrid, pungent, essential oil. According to Einhoff, the distilled watery liquid yields traces of sulphur.

Medical Properties and Uses.—The use of the scraped root as a warm pungent condiment to various kinds of animal

food, and also to give a zest to winter salads, is well known. As an article of the materia medica its effects much resemble those of mustard-seed, but it is somewhat more powerful. Infused in water, and received into the stomach, it acts as a stimulant, diuretic, and sudorific, and is occasionally employed with advantage in paralytic affections and chronic rheumatism; it has also been successfully administered in dropsy supervening upon intermittent fever, particularly by Sydenham. This infusion, taken with large draughts of warm water, readily proves emetic, and may either be employed by itself to excite vomiting or to assist the operation of other emetics. It has also been used as a sialagogue, in paralysis of the tongue, in some obstinate cutaneous diseases, and in asthma. One drachm of the root infused in a close vessel, with four ounces of boiling water, and made into a syrup with double its weight of sugar, taken in the quantity of a teaspoonful, and swallowed leisurely, is strongly recommended by Dr. Cullen to remove hoarseness, arising from relaxation or deficient secretion of mucus. Externally it readily inflames the skin, and if its application be long continued, produces blisters. An infusion of the root in milk is recommended by Dr. Withering, as one of the safest and best cosmetics. Horse-radish may be given in doses of a drachm or more of the recent root cut into small pieces, and swallowed entire.

Off. Prep.—Infusum Armoraciæ compositum, *L. D.*
Spiritus Armoraciæ compositus, *L. D.*

COCHLEARIA OFFICINALIS.—*Common Scurvy-grass.*

SPEC. CHAR. *Radical leaves* roundish, those on the *stem* oblong and somewhat sinuated. *Pod* globose.

Syn.—Cochlearia, *Raii Syn.* 302; *Bauh. Hist. v.* 2. 942. *f.*; *Camer Epit.* 271. *f.*;
Cochlearia rotundifolia, *Ger. Em.* 401. *f.*
Nasturtium, *n.* 503.; *Hall. Hist. v.* 1. 218.
Cochlearia officinalis, *Lin. Sp. Pl.* 903; *Willd. v.* 3. 448.; *Fl. Brit.* 688. *Eng. Bot. v.* 8. *t.* 551.; *Woodv. t.* 29.; *Hook. Lond.* 195.

FOREIGN.—*Cranson officinal*, Fr.; *Cochlearia*, It.; *Gemeine Löffenkraut*, Ger.

SCURVY-GRASS is a low, annual plant, growing wild on the sea-coasts of Britain and other countries, and not unfrequently in mountainous situations far inland. It varies considerably in size and luxuriance, and somewhat in the shape of its foliage. The stem is angular, smooth, usually a foot high, and, in the month of May, ornamented with numerous tufts of flowers of a snow-white colour. The leaves are all smooth, and rather succulent: the radical ones on long footstalks, of a roundish-heart shape, and wavy; the cauline ones smaller, embracing the stem, oblong, sinuated, or deeply toothed. The calyx leaves are ovate, obtuse, concave; petals obovate, with longish claws; stamens six, incurved; pod nearly globular, slightly rugose, and crowned with a short style. A thick-leaved variety called Dutch scurvy-grass is sometimes cultivated in gardens for medicinal purposes.

QUALITIES.—The whole herb has a warm, acrid taste, and a pungent rather unpleasant smell when bruised. It's active matter is extracted by maceration, both by water and alcohol; but its principal virtue seems to reside in an essential oil, separable in very small quantity by distillation in water.

USES.—Scurvy-grass has long enjoyed the reputation of being one of the most powerful of the antiscorbutic plants. Sydenham and Lewis recommend it strongly, combined with arum and wood-sorrel, in rheumatic and paralytic affections. As an antiscorbutic, the expressed juice of the plant should be taken in the quantity of a pint a day, or the smaller leaves daily eaten as a salad. Of equal virtue, however, with scurvy-grass, is the horse-radish, mustard, the tops of turnips, water-cress, lime-juice, oranges, and many other vegetables.







Pyrus Cydonia L.

GReid del.

CXV

PYRUS CYDONIA, *vel* CYDONIA VULGARIS.

Common Quince-tree.

Class XII. Icosandria.—*Order* IV. Pentagynia.

Nat. Ord. Pomaceæ, *Lin. De Cand, &c.* Rosaceæ, *Juss.* Pyraceæ, Pyridæ, *Burn.*

Gen. Char. *Calyx* superior, 5-cleft. *Petals* 5. *Germen* inferior, with from 2 to 5 cells, many-seeded.

Spec. Char. *Leaves* roundish, elliptical, entire; downy beneath. *Flowers* solitary, stalked. *Calyx* serrated, reflexed.

Syn.—Malus cotonea, *Ger. Em.* 1452 ; *Raii Hist. p.* 1452 ; *Bauh. Hist. v.* 1. *p.* 35 ; *Matth. Valgr. v.* 1. 217.
Cotonia et Cidonia mala, *Lob. Ic. v.* 2. *p.* 152.
Pyrus Cydonia, *Lin. Sp. Pl.* 687. *Willd.* 2. *n.* 17. *Jacq. Austr. t.* 342. ; *Woodv. v.* 2. *t.* 79.

Foreign.—*Coignassier*, Fr. ; *Melacotogna*, It. ; *Quittenkorner*, Ger. ; *Abee*, Hind.

The Quince-tree is a native of the rocky banks of the Danube, and is naturalized in the hedges of Germany. Dr. Sibthorp found it wild in the northern parts of Greece, in which country it still retains the ancient name κυδωνια', so called from Cydon, a town in Crete, where it grew. Thunberg found it growing in Japan, where it is called *umbats*. It was among the first of the exotic fruits cultivated in England, where it blossoms in May or June, and ripens its fruit in November.

The tree is of low growth, much branched, and generally distorted. The leaves are roundish or ovate, entire, varying in size, smooth, and of a dusky green colour above, paler and downy beneath, and stand upon short foot-stalks. The flowers are large, solitary, and of a pale rose-colour, or white ; the calyx is superior, villous, persistent, and divided into five spreading segments : the corolla is composed of five petals ; these are concave, roundish, and inserted into the calyx : the filaments are about twenty, awl-shaped, shorter than the corolla, and support

yellow anthers: the germen is orbicular, with five slender styles, and simple stigmas. The fruit is large, varying in shape, yellow, downy, umbilicated, and when ripe has a peculiar fragrant odour, and a very austere acidulous taste; each of its cells contains two or three ovate, angular, reddish brown, cartilaginous seeds, ranged horizontally.—Fig. (*a*) section of the fruit; (*b*) a seed.

There are different varieties of the fruit; as the globular, or apple-quince; oblong, or Portugal quince; and the pear-shaped, or pear-quince. The Portugal quince is the best, but the fruit is produced sparingly. The quince-tree is propagated by layers, by suckers, or by cuttings. It thrives best in a moist soil, but the fruit is superior in a dry one. The quince is supposed by some persons to be the golden apple of the Hesperides, so famous in ancient fable.

Qualities and Uses.—The seeds are inodorous, nearly insipid, and abound with an impure mucilage, which they yield to boiling water. One drachm makes six ounces of a nearly colourless transparent mucilage, resembling in consistency the white of egg; which is occasionally prescribed as a demulcent in gonorrhœa, tenesmus, dysentery, and in aphthous affections and excoriations of the mouth and fauces; in the latter case it is generally combined with borax and honey. A diluted solution of it injected beneath the eye-lids is recommended by Dr. Thompson, for obtunding the acrimony of the discharge in violent inflammations of the eye. It is the most agreeable of all the mucilages; but is apt to spoil and become mouldy in a short time.

In its raw state the fruit is not eatable; but when prepared, it becomes mild, and to many persons highly grateful. A small portion of it added to stewed or baked apples is useful for giving pungency and flavour. The expressed juice taken in small quantities is cooling, antiseptic, and astringent, useful in nausea and vomiting, as well as in some kinds of diarrhœa; by boiling, it loses its astringency. Formerly the juice was directed in the London Pharmacopœia to be made into a syrup; but the only preparation of the quince which it now directs, is the decoction of the seeds. An elegant sweetmeat or marmalade (*Miva cydoniarum*) is prepared by boiling the pulp over a gentle fire with an equal weight of sugar.

Off. Prep.—Decoctum Cydoniæ, L.

Pl. 116.



Tanacetum vulgare?

CXVI

TANACETUM VULGARE.

Common Tansy.

Class XIX. SYNGENESIA.—*Order* II. POLYGAMIA SUPERFLUA.

Nat. Ord. COMPOSITÆ, γ, DISCOIDEÆ, *Lin.* CORYMBIFERÆ, *Juss. De Cand. &c.* ASTERACEÆ, *Burn.*

GEN. CHAR. *Receptacle* naked. *Fruit* with a membranous crown. *Involucrum* imbricated, hemispherical. *Florets* of the circumference 3-cleft, obsolete, sometimes wanting.

SPEC. CHAR. *Leaves* doubly pinnatifid, deeply serrated, naked.

Syn.---Tanacetum, *Raii Hist.* 108; *Ger. Em.* 650. *f.*; *Matth. Valg. v.* 2. 259. *f.*; *Camer. Epit.* 650. *f.*; *Trag. Hist.* 158. *f.*
Tanacetum millefolii foliis, *Lob. Ic.* 749. *f.*
Tanacetum, *n.* 132; *Hall. Hist. v.* 1. 57.
Artemisia monoclonos, *Fuchs. Hist.* 46. *f.*
Athanasia seu Tanacetum, *Dalech. Hist.* 955.
Tanacetum vulgare, *Lin. Sp. Pl.* 1184; *Willd. v.* 3. 1814: *Fl. Brit.* 862; *Eng. Bot. v.* 18. *t.* 1229; *Hook. Scot.* 239. *Bull. Fr. t.* 187; *Woodv. t.* 115; *Stokes v.* 4. 180.

FOREIGN.---*Tanassie*, Fr.; *Tanaceto*, It.; *Atanasia*, Sp.; *Rheinfarn*, Ger.; *Wormkruid*, Dut.; *Rheinfan*. Dan.; *Dikaja riabina*, Russ.

TANSY is a well-known perennial plant, a native of most parts of Britain, growing generally on the banks of rivers, hedges, and the borders of fields; flowering in July and August.

The root is long, somewhat creeping, and fibrous. In a wild state it seldom exceeds two feet in height; the stem is erect, rather angular, striated, leafy, solid, unbranched, smooth, and frequently reddish towards the top; the leaves alternate, dark green, smooth, doubly pinnatifid, and notched or deeply serrated. The flowers are numerous, of a golden yellow colour, flattish, and terminate the stem in a dense corymb. The involucre is hemispherical and imbricated; the scales are acute and mem-

branaceous at the margin. The florets are of two kinds; those of the *disk hermaphrodite*, numerous, tubular, and 5-cleft; those of the *radius female*, few, sometimes wanting, tubular at the base, and 3-cleft. There are five capillary, very short filaments, in the florets of the disc only, with the anthers forming a cylindrical tube; the germen in both is obovate, compressed; the style thread-shaped; and the stigma bifid and reflexed; the permanent involucre contains solitary, oblong, angular akenia, or rather, akenopsides crowned with a membranous border.—Fig. (*a*) a floret of the disc; (*b*) floret of the radius; (*c*) involucre; (*d*) receptacle.

Besides the common tansy, there are two or three other species, very generally cultivated in our gardens, particularly the annual tansy, (T. *annuum;*) and the costmary tansy, or ale-cost (T. *Balsamita.*) Of the former there is a variety with curled leaves, which is often called double tansy, and likewise a sort with variegated leaves, which is sometimes admitted into shrubberies.

Qualities.—The leaves and flowers have a warm, bitter taste, and a strong, peculiar, not unpleasant odour. These qualities they readily impart both to water and alcohol; and a greenish-yellow essential oil is afforded by distillation with water, smelling strongly of the herb.

Medical Properties and Uses.—Tansy is tonic, stomachic, and anthelmintic; and as such is useful in dyspepsia, dropsy, hysteria, intermittent fever, obstructed menstruation, and other diseases; it also forms a popular remedy for expelling worms, particularly the *lumbricus teres*, or round worm. Not only the leaves and flowers have been employed with this intention, but also the seeds, which, according to Dr. Woodville, are sometimes substituted for those of Santonicum. The infusion in boiling water has been strongly recommended by Dr. Clarke as a preventive of the return of gout;* but experience has not confirmed its utility. The young leaves are sometimes shredded and employed to give flavour and colour to puddings; and the Finlanders prepare a red dye from them. If dead animal matter be rubbed with this plant, Dr. Withering says, the flesh-fly will not attack it.

Dose.—In powder, the dose may be from ℈j to ʒj, twice or thrice a-day; but it is more commonly taken in infusion, under the name of Tansy tea.

* Clarke's Essays Physical and Literary, v. 3, p. 438.



Prunus Lauro-cerasus.

CXVII

PRUNUS LAURO-CERASUS.

Common Cherry-Laurel.

Class XII. Icosandria.—*Order* I. Monogynia.

Nat. Ord. Pomaceæ, *Lin.* Rosaceæ, Amygdaleæ, *Juss.* Drupaceæ, *De Cand.* Prunaceæ, *Burn.*

Gen. Char. *Calyx* inferior, 5-cleft. *Petals* 5. *Nut* of the *drupe* with prominent sutures.

Spec. Char. *Flowers* in racemes. *Leaves* evergreen, bi-glandular at the base.

Syn.—Laurocerasus, *Ger. Em.* 1603; *Raii Hist.* 1549; *Cämer. Hort. t.* 23; *Clus. Hist.* 1. 4; *Tourn. Inst.* 627; *Du Hamel Arbr.* 1. *t.* 133.

Cerasus trapezuntina, sive Laurocerasus, *Park. Theatr.* 1518. *f.* 2; *Parad.* 401. *t.* 399. *f.* 6.

Cerasus folio laurino, *Bauh. Pin.* 450.

Padus Laurocerasus, *Mill. Dict. n.* 4; *Lin. Hort. Cliff.* 185.

Prunus Laurocerasus, *Lin. Sp. Pl.* 678; *Willd.* ii. *p.* 988; *Hort. Kew.* ii. 164; *Bull. Fr.* 153; *Pallas Fl. Ros. v.* 1. *p.* 17; *Plenck. Icon.* 383; *Woodv. 2d. ed.* 515. *t.* 185.

Foreign.—*Laurier-cerise, Fr.; Lauro regio; Lauro di Trabesonda, It.; Loirocerejo,* Port.; *Lorbeerkirsche; Kirschlorbere,* Ger.

The cherry-laurel is a native of the Levant, and was cultivated in Britain as early as 1629; but the precise period of its introduction is uncertain. It is a hardy evergreen shrub, or small tree, and is planted near houses, and in shrubberies, as an ornamental plant, producing its elegant spikes of odorous white blossoms early in May. We may remark, that it is frequently mistaken for the bay, and is erroneously regarded as the plant which furnished crowns for the Roman heroes. There is no doubt, however, that it was the sweet-bay (Laurus *nobilis*) which furnished the wreath worn on the brow of the victor, and of the priestess of Delphi. The mistake is supposed to have arisen from the bay, which is a true laurus, having formerly

been called laurel, and the fruit of it only named *bayes*, while in modern times the cherry-laurel has usurped its name.

The cherry-laurel attains the ordinary stature of a plum or cherry-tree, sending off long spreading branches, covered with a smooth brown bark. The leaves are alternate, and stand upon short foot-stalks; they are elliptical or obovate, tapering towards the base, pointed and curved at the apex, minutely toothed, smooth, and polished with a prominent midrib, and of a deep green colour. At their base, underneath, are two small yellow glands. The flowers are in spikes, on short, simple, axillary peduncles. The calyx is inferior, bell-shaped, and divided at the brim into five obtuse segments. The corolla consists of five small white concave, roundish, spreading segments. The filaments, which are alternately long and short, are about eighteen, awl-shaped, inserted into the calyx, and furnished with roundish yellow anthers. Before the petals unfold, the stamens are inflexed, and the anthers disposed in a circular form within the rim of the calyx, as is well represented on the plate (fig. *a*). The germen is roundish, supporting a columnar style, and terminated by an orbicular stigma. The fruit, or drupe, is globular, of a shining black colour, and resembling a small cherry, both in its external appearance and internal structure. Fig. (*a*) represents a section of a flower, showing the position of the stamens; (*b*) the germen and style; (*c*) the fruit; (*d*) a drupe cut across, to show the nut or stone.

The plum, the cherry, and the cherry-laurel, all included by Linnæus in his genus *Prunus* were considered generically distinct by the older botanists; and in modern times they are again admitted as sub-genera, even by those who deny their differences to be sufficient to constitute generic characters.

The Pruni are easily distinguished from the Cerasi and Lauro-cerasi by the fruit being *pruinose* or covered with a resinous excretion called *bloom*, while in both the latter the drupes are glaucous; but in the *Cerasi* or true cherries, the inflorescence is in tufts or sertula, while in the *Lauro-cerasi* it is in racemes: the distinction is important, because it is in the latter group that prussic acid is the most abundant.

Poisonous Effects.—The distilled water of this plant, the virtues of which depend on the prussic acid that it contains, is a deadly poison. When applied to wounds in animals it induces vomiting, convulsions, great prostration of strength, diminished sensibility, and death. Injected into the stomach and rectum, it excites a similar train of symptoms, excepting that, in the latter, the convulsions are more violent, and tetanus of the extremities is produced. Its action has been found most rapid and intense when injected into the jugular vein.

Many cases are on record of its effects on man; the earliest with which we are acquainted, are contained in the 37th vol. of the Phil. Trans., in a paper communicated by Dr. Madden of Dublin, part of which we give. "A very extraordinary accident that fell out here some months ago, has discovered to us a most dangerous poison, which was never before known to be so, though it has been in frequent use among us. The thing I mean is a simple water, distilled from the leaves of the *Lauro-cerasus*. The water is, at first, of a milky colour but the oil which comes over with it, being in a good measure separated from the phlegm; by passing it through a flannel-bag, it becomes as clear as common water. It has the smell of the bitter almond, or peach-kernel, and has been for many years in frequent use among our housewives and cooks, to give that agreeable flavour to their creams and puddings. It has also been much in use among our drinkers of drams; and the proportion they generally use it in, has been one part of laurel-water, to four of brandy. Nor has the practice, (however frequent,) ever been attended with any apparent ill consequences, till some time in the month of September, 1728, when it happened that one Martha Boyse, a servant, who lived with a person that sold great quantities of this water, got a bottle of it from her mistress, and gave it to her mother, Anne Boyse, as a very rich cordial.

"Anne Boyse made a present of it to Frances Eaton, her sister, who was a shopkeeper in the town, and who she thought might oblige her customers with it. Accordingly, in a few days, she gave about two ounces of the water to a woman called Mary Whaley, who had bought some goods of her. Mary Whaley drank about two-thirds of what was filled out, and went away. Frances Eaton drank the rest. Mary Whaley went to another shop, and in about a quarter of an hour after she had drank the water, she complained of a violent disorder in her stomach. She was carried home, and from that time she lost her spirits, and died in about an hour, without vomiting, or purging, or any convulsion.

"The shopkeeper, Frances Eaton, sent word to her sister, Anne Boyse, of what had happened, who came to her and affirmed that it was not possible that the cordial, as she called it, could have occasioned the death of the woman; and to convince her of it, she filled out about three spoonsful, and drank it. She continued talking with Frances Eaton about two minutes longer, and was so earnest to persuade her of the liquor being inoffensive, that she poured out two spoonsful more, and drank it off likewise. She was hardly well seated in her chair, when she died, without the least groan or convulsion. Frances Eaton, who had drank somewhat above a spoonful, found no disorder in her stomach or elsewhere; but to prevent any ill consequences, she took a vomit, and has been well ever since.

"Mary Whaley was buried without being examined by any one that

I can find, except the coroner. I went to see Anne Boyse about twenty-four hours after her death, but could not prevail to have her opened. She was about sixty years old; her countenance and skin appeared well coloured, and her features were hardly altered, so that she looked as one asleep. Her belly was not swelled, nor had she any other external mark of poison.

"This accident brought into discourse another of the like nature, which happened about four years since in the town of Kilkenny. A young gentleman, son to Alderman Evans, mistook a bottle of laurel-water for one of ptisan. What quantity he drank is uncertain, but he died in a few minutes, complaining of a violent disorder in his stomach. The affair was not much regarded at that time, because he laboured under a distemper, to which, or to an improper use of remedies, his death was attributed by those about him."

Then follow Dr. Madden's experiments on animals; and the same volume contains also a narration of Dr. Mortimer's.

Foderè states, that "when he was attending his studies at Turin, in 1784, the chambermaid and man-servant of a noble family of that town, stole, for the purpose of regaling themselves, a bottle of distilled laurel-water, which they mistook for an excellent cordial. Fearful of being surprised, they hastily swallowed, one after the other, several mouthfuls of it: but they soon paid a fearful price for their dishonesty, as they expired almost instantly in convulsions. The dead bodies were carried to the university for examination. The stomach was found highly inflamed, but the rest of the organs were in a sound state." *

A very interesting trial took place during the last century, from a supposition (well grounded we conceive) that the distilled laurel-water had been administered. As it is often referred to by medico-legal writers, we think it right to give the account, which, with some remarks of Professor Beck, are quoted from his valuable work on Medical Jurisprudence; the pamphlet, containing an account of the trial, taken in short-hand by Mr. Gurney, being so scarce that we are unable to obtain it.

"Sir Theodosius Boughton was a young gentleman of fortune in the county of Warwick, and nearly arrived at the age of twenty-one. His mother and his brother-in-law, Captain Donellan, and his sister, (Mrs. Donellan,) resided with him. In the event of his dying before the period of his majority, the greatest part of his fortune descended to his sister, and Captain Donellan would thus become entitled to a life-estate in it. Sir Theodosius was labouring under a slight syphilitic affection, for which he was attended by Mr. Powell of Rugby. His general health was, however, stated to have been good. On the 29th of August, 1780, Mr. Powell sent him a draught to be taken on the next morning, consisting of rhubarb and jalap, each fifteen grains; spirits of lavender, twenty drops; nutmeg-water, two drachms; simple syrup, two drachms; and an ounce and a half of simple water. The bottle containing this draught was placed on a shelf in his bed-room. He returned in the afternoon of this day from fishing, in good health and spirits. In the morning, a servant awoke him at an early hour, for

* Foderè, vol. iv. p. 27.

the purpose of obtaining some straps for a net. He arose, and went into the next room for them. Even now he appeared in perfect health. About seven A. M. Lady Boughton got up and went into his room, as he had before desired her, to give him the medicine. She inquired whether he had taken it, or whether he chose that she should give it to him. He desired her to reach down the draught which was labelled "Purging Draught for Sir T. B.," and she poured it into a cup, for the purpose of his taking it. He had not, however, swallowed more than half of it, when he complained that it was so nauseous to the taste, and disagreeable to the smell, that he did not apprehend he should be able to keep it on his stomach. This remark induced Lady Boughton to smell the draught. She found it very peculiar in this respect, and observed to him that it smelt very strongly of bitter-almonds. He ate some cheese in order to take the taste out of his mouth, and afterwards washed his mouth with some water. In about two minutes after swallowing the draught, he appeared to struggle very much, as if to keep it down, and had a rattling and guggling in his stomach. These symptoms continued about ten minutes, when he seemed to Lady Boughton to be inclined to go to sleep, and she left the room. She returned again in about five minutes, and was surprised to find him with his eyes fixed upwards, his teeth clenched, and froth running out of his mouth. He died in about half-an-hour afterwards, never having spoken since he took the draught.

"Captain Donellan came into the room when Sir Theodosius was dying, and inquired of Lady Boughton where the physic-bottle was. She showed it to him. He immediately took and poured water into it, shook it, and then emptied its contents into the wash-hand basin. And he persisted in doing this with another bottle, although Lady Boughton remonstrated, and objected to his conduct. Mr. Powell was sent for, but arrived after the death of Sir Theodosius. It appeared also in evidence, that Captain Donellan had a still in his own room, and that he had used it for distilling roses.

"Some days after the death of Sir T., he brought this still to one of the servants to be cleaned. It was full of lime, and the lime was wet. On the other hand, it appeared on the cross-examination of Lady Boughton, that Sir T., a short time before his death, had bought arsenic to poison fish, and some of this was afterwards found locked up in his closet. Suspicions soon began to be excited as to the cause of this sudden decease, and when these reached the ears of Sir W. Wheeler, the guardian of the young baronet, he wrote to Captain Donellan, informing him of the rumours that were abroad, and requesting him to have the body opened, to satisfy the family and the public. Donellan immediately assented to this, and sent for some medical gentlemen. He, however, did not explain to them the cause of his request; and as they were led to suppose it merely an ordinary case, they declined the performance, on account of the putrefaction of the body. It is not necessary, nor indeed does it belong to this statement, to enumerate the various devices by which Donellan evidently attempted to elude the wishes of Sir W. Wheeler respecting a dissection. On the eighth day after death the body was buried; but it was taken up immediately after by the coroner and opened. It was found swollen and distended, the face was black, the lips swollen and retracted, and showing the gums,

the teeth black, the tongue protruding, and the skin spotted in various parts of the body. 'The orifices and small arch of the stomach, and the intestines, bore the appearance of inflammation; the heart was natural, the lungs were suffused with blood, looking red, and spotted in many places with black specks; and on the back part, the blood had settled in a deep-red colour, almost approaching to purple; the diaphragm was in the same state, and in general upon the depending surfaces of the body, the blood was settled in the like manner: the kidneys appeared black as tinder, and the liver was much in the same state.' There was also some extravasated blood in the thorax.

"Several physicians and surgeons deposed, that they performed experiments on animals with laurel water, and found the effects very similar to the symptoms produced in Sir T. Boughton's case. Death succeeded in a few minutes, after having been preceded by convulsions. The appearances on dissection also agreed.

"It may be mentioned in this place that Mr. Powell prepared a draught precisely alike to that which he had sent to the Baronet, with the addition of some laurel-water; and Lady Boughton on being requested to smell to it, stated that it resembled the one she had given to her son.

"The counsel for the prisoner, in their cross-examination, inquired of the medical witnesses, whether the presence of epilepsy or apoplexy would not account for the symptoms observed? To this a negative answer was given. Dr. Parsons thought they resembled the latter most, but he was decided in attributing them to the effects of the medicine. Sir Theodosius was young, of a spare habit, and it was, therefore, very improbable that apoplexy should have caused his death. They also inquired, whether the appearances observed on dissection might not be the effects of putrefaction. It was allowed that the external might; but not the internal.

"On the part of the prisoner, the celebrated JOHN HUNTER was summoned as a witness: and the judge (the Hon. F. Buller) in summing up the evidence, after stating that four medical witnesses were decided in attributing death to the effects of the laurel water, made the following comments on his testimony:—'For the prisoner, you have had one gentleman called, who is likewise one of the faculty, and a very able man. I can hardly say what his opinion is, for he does not seem to have formed any opinion at all of the matter. He, at first, said he could not form an opinion whether the death was or was not occasioned by the poison, because he could conceive that it might be ascribed to other causes. I wished very much to have got a direct answer from Mr. Hunter, if I could, what, upon the whole, was the result of his attention and application to the subject, and what was his present opinion, but he says he can say nothing decisive. So that upon this point, if you are to determine upon the evidence of the gentlemen who are skilled in the faculty only, you have the very *positive opinion* of four or five gentlemen of the faculty that the deceased died of poison. On the other side, you have what I really cannot myself call more than the *doubt* of another; for it is agreed by Mr. Hunter, that the laurel-water would produce the symptoms which are described. He says an epilepsy or apoplexy would produce the same symptoms; but as to an apoplexy, it is not likely to attack so young and so thin a man as Sir Theodosius was;

and as to epilepsy, the other witnesses tell you they don't think the symptoms which have been spoken of, do show that Sir Theodosius had epilepsy at the time.' "

The jury retired for about an hour, and then brought in a verdict of guilty, and Capt. Donellan was executed.

It was and still is (says professor Beck) a prevailing opinion with many, that Sir T. Boughton was not poisoned, and that the captain was innocent. Dr. Male notices this case as " a melancholy and striking instance of the unhappy effects of popular prejudice, and the fatal consequences of medical ignorance." Mr. Phillips, in his " Theory of Presumptive Proofs," adduces it as an instance where a man was unwarrantably condemned on circumstantial evidence.*

As a medical man it might be inquired of Dr. Male, whether the symptoms preceding this death have not been most strikingly and astonishingly verified, as probably originating from laurel-water, by the subsequent investigations of chemists and physicians. Mr. Hunter says, in his testimony, that he had never known laurel-water to act so rapidly as the other medical witnesses described. He had injected it into the veins and into the stomach of animals, *but it never produced so quick an effect.* Who have subsequent trials proved to be correct on this point—Mr. Hunter, or the other witnesses ?

The fact of Captain Donellan's having a still is cautiously omitted in Mr. Phillips's statement of the case, and it is evident from his comments, that they are founded on imperfect information concerning the subject in dispute.

Another circumstance has also been overlooked or not mentioned, viz. that in Captain Donellan's secretary there was found, that part of the Philosophical Transactions, and that alone, in which the essay on the effects of cherry-laurel water, and its mode of preparation, are described : and curiously enough the *page* was *turned* down at that particular part, as if to afford evidence of its having been the subject of study.

The *oil of laurel* also acts as a virulent poison, and in a similar manner to the *distilled water.* The *watery extract,* however, according to Orfila, is very feeble, and comparatively innoxious in its operation. For the effects of bitter almonds, and of their essential oil, we refer our readers to Art. XLIII. Vol. I. of this work.

The kernels of the peach are very often distilled for the purpose of impregnating *eau de noyau,* and if too strongly impregnated with the oil, it must prove noxious. The late Duke Charles of Lorrain nearly lost his life by swallowing a small quantity of this liquor, and although we are unable to furnish our readers with the particulars, several fatal cases have occurred in England.

Qualities and Chemical Properties.—The leaves and bark of this tree are of a bitter, somewhat acrid taste, and have a smell characteristic of the volatile oil which they contain. This oil is most abundant in the leaves when gathered in the autumn. It is formed of two parts ; one crystallizable, the other

* Appendix to his Law of Evidence, p. 30.

uncrystallizable and very poisonous. A particular vegetable principle which has been long known, but has till lately been confounded with gum, exudes nearly in a pure state from this and some other trees. To it, Dr. John gave the name of *cerasin*. *Cerasin* is a solid substance possessing the appearance of gum, and is distinguished by a similar taste. It is usually harder than gum, and not so easily reduced to powder; when put into water, it imbibes that liquid, swells up considerably, and becomes semi-transparent, and gelatinous, but is not in the least soluble. It dissolves in boiling water, but again precipitates when the liquid cools, and remains in the state of a jelly. Cerasin is insoluble in alcohol and ether. *Gum Tragacanth* may be considered as pure *cerasin*. But the most important product of the Prunus *lauro-cerasus* is the volatile oil (*prussic* or *hydrocyanic acid*) which it yields on distillation, and the poisonous effects of which are particularly adverted to in the remarks on distilled laurel-water.

Prussic acid, when obtained for medicinal purposes, is however procured in a different manner; and as it is all-important that it be of uniform power, we give Vauquelin's method, which is principally recommended by British practitioners, and resorted to by our best chemists. M. Vauquelin obtains it by decomposing the cyanuret of mercury by sulphuretted hydrogen. To a retort he adapts a globe, containing a mixture of sulphuret of iron and diluted sulphuric acid. The cyanuret of mercury is placed in a horizontal tube, bent to a right angle, at the extremity of which, enters the globe. The cyanuret of mercury is placed in the horizontal part of the tube, near the extremity attached to the globe. Beyond the deuto-cyanuret, fragments of carbonate of lead and of chloruret of calcium are placed, the former to absorb the small quantity of sulphuretted hydrogen which might remain undecomposed by the cyanuret of mercury, the latter to take up the water which the hydrocyanic acid might otherwise carry along with it.

Scheeles' method furnishes an impure product, and when the new Pharmacopœia appears, we hope to find a standard rule for procuring so powerful a medicine.

Prussic acid, at the ordinary temperature, is liquid, transparent, and colourless; its taste, at first of an agreeable freshness, soon becomes acrid and irritating; it slightly reddens the tincture of turnsol. Its odour is powerful and noxious; being insupportable when not mixed with a large proportion of air—it then resembles the smell of bitter almonds. Prussic acid is extremely volatile; in fact, it boils at 26°. 5, under a pressure of 0°. 76; and at 10° sustains a column of mercury at 0°. 38. Its congelation is however easily effected, and takes place at 15° of Fahr.: so that when a few drops of this acid are poured upon paper, the portion which evaporates instantly produces a degree of cold sufficient to crystallize the other: it is the only liquid which possesses this property. It is but slightly soluble in water, on which account, when agitated with ten or twelve times its bulk of this fluid, it collects on the surface in the manner of oil or ether. It is readily soluble in alcohol. Left to itself in ill-stopped vessels, it sometimes decomposes in less than an hour; according to M. Majendie, it can rarely be preserved longer than a fortnight. Messrs. Waugh, in Regent Street, are said, however, to prepare it after the formula of Dr. Nimmo, and warrant it to keep, without deterioration, for six months.

Perhaps the most safe and elegant mode of administering minute and accurate doses of Prussic acid, is to liberate it from the cyanuret of potassium, as recommended by Mr. Laming.

Prussic acid exerts the same deadly powers that the distilled laurel-water does, but in a more eminent degree. One drop, in a pure state, placed on the tongue of a dog or cat, induces a few hurried inspirations, and death immediately ensues. Dropped into the eye, it produces effects equally sudden. One drop diluted with several drops of alcohol, injected into the jugular vein, will kill the animal as suddenly, as if it were struck with lightning; and in animals poisoned in this manner, scarcely any traces of muscular irritability can be detected a few moments after death.

Cases are continually occurring in this country, in which prussic acid has been taken with the express intention of producing death; and in the *Annales de Chimie* for 1814, the following one

is recorded. A professor of chemistry left a flask containing alcohol saturated with prussic acid; the servant-maid, seduced by the agreeable smell of the liquor, swallowed a glass of it. At the expiration of two minutes she fell dead, as if she had been struck with apoplexy. The body was not opened.

Orfila also mentions that Professor Scharinger, of Vienna, prepared some pure and concentrated prussic acid, a certain quantity of which he diffused on his naked arm, and died a short time after.

Hufeland relates the following case. "D. L., a robust and healthy man, ætat. 36, on being seized as a thief by the police, snatched a small sealed phial from his pocket, broke off the neck, and swallowed the greater part of its contents. A strong smell of bitter-almonds soon spread around, which almost stupefied all present. The culprit staggered a few minutes. then, without a groan, fell on his knees, and sunk lifeless on the ground. Medical assistance being called in, not the slightest trace of pulse or breathing could be found. A few minutes afterwards, a single and violent inspiration occurred, which was again repeated in about two minutes. The extremities were perfectly cold, the breast and abdomen still warm, the eyes half open and shining, clear, lively, full, almost projecting, and as brilliant as those of the most ardent youth under violent emotion. The face was neither distorted nor convulsed, but bore the image of quiet sleep. The corpse exhaled a strong odour of bitter-almonds. And the remaining liquid in the phial being analysed, was found to be a concentrated solution of prussic acid in alcohol.

Even its vapour should be carefully avoided; for if respired it causes considerable pain in the chest, and a feeling of oppression which does not go off for several hours. It also has a very deleterious effect on germination, exerting an influence on living vegetables, almost as powerful as on animals, speedily destroying their vitality.

Tests.—It having been denied that the presence of the vegetable poisons could be detected, the attention of chemists has been directed to this point; and in the *Archives Generales* for August 1824, M. Lassaigne has made known the proper method of de-

tecting hydrocyanic acid in the human body. Before devoting himself to the research on this substance in the stomach of animals, he considered it proper to study the actions of the re-agents on this acid. He is satisfied that, by saturating an aqueous solution of hydrocyanic acid, with a small quantity of *potass*, and then touching it with a little *sulphate of iron*, he could detect the $\frac{1}{10000}$ part of the weight of water. If instead of the sulphate of iron, he employed *sulphate of copper*, and then added a sufficient quantity of muriatic acid to dissolve the excess of oxyde of copper which had been precipitated by the alkali; the solution assumed a milky appearance, at the time when it only contains $\frac{1}{20000}$ part of its weight of acid. If we dilute this solution in a large quantity of water, the precipitation disappears in a few hours, and the fluid becomes clear, especially if the liquid in which the precipitation first took place has the muriatic acid a little in excess.

A fact well worthy of remark is, that in making the two-fold experiment by these tests, that made by the sulphate of copper will have its effect disappear, and the fluid will become clear frequently before that which has been treated by the sulphate of iron has acquired the blue colour proper to it. It sometimes happens, that this colour does not show itself for twelve, and sometimes for eighteen hours afterwards.

It is by the help of these tests that M. Lassaigne has discovered, *forty-eight hours after the death of a cat*, the hydrocyanic acid in the intestinal tube. The method of procedure is to distil in a tubulated retort, the fluid that has been obtained from the intestines by cutting them into small pieces. As the hydrocyanic acid is very volatile, it passes over in distillation. When you have obtained about $\frac{1}{3}$ of the fluid, you need not carry the operation further, but saturate the product by potash, and examine it by the two modes before described. The following observation has been deduced from the experiments of this chemist:—

1. That by these two tests he could detect, in a distilled fluid, hydrocyanic acid in the proportion of $\frac{1}{10000}$ to $\frac{1}{20000}$ of the weight of water.

2. That it is possible to detect it, in poisoned animals, more than forty-eight hours after death.

3. That it is always in the viscera that its vestiges can be discovered.

4. That not the least portion can be detected in the brain, spinal marrow, or heart. Although they give out an odour which causes its existence to be suspected.

From a paper read, however, before the Royal Academy of Medicine at Paris, by M. Itard, it appears that a spontaneous development of prussic acid is occasionally met with in the alvine evacuations. He quoted two cases of the kind. The first subject had inflammation of the intestines; the other symptoms of inflammation of the liver. In both individuals, the stools smelt strongly of bitter almonds. These facts are certainly highly important in a medico-legal point of view; as the existence merely of the odour of prussic acid in the fæces cannot, under such circumstances, be received as evidence that the person had been poisoned with this medicine. M. De Lens related, on the same occasion, several facts, which showed that prussic acid had been found in the perspiration, urine, and expectoration, accounting for the blue colour of those liquids. M. Dupay observed, that cows fed in certain pastures gave blue milk. M. Virey quoted a case where cows fed with the PRUNUS *Padus*, exhaled a very strong smell of bitter almonds.

The existence of prussic acid in the excrements of these animals was ascertained by the sulphate of iron. M. Mark related that in Germany some persons had been poisoned by eating sausages, in all of whom a great quantity of prussic acid was spontaneously developed.

TREATMENT.—The effects of this poison are so instantaneous, that when taken with a view to suicide, the fatal purpose is generally at once accomplished. Occasionally, however, serious effects are produced by overdoses in medicine; and under such circumstances, in addition to the means recommended in ART. XXXVII. under the head of NICOTIANA TABACUM, we should recommend cold affusion to the head, and repeated doses of ammonia, solutions of chlorine, or chloride of lime, warm brandy and water, or the spirits of turpentine.

Medical Properties and Uses — Dr. Elliotson justly observes in his valuable work,* that hydrocyanic acid can scarcely be called a new medicine, as the leaves of the lauro-cerasus, bitter almond, and other substances containing it, and from which they derive their virtues, were long ago employed as remedies. Dr. Brown Langrish† tells us that the powder of the dry leaves of the lauro-cerasus was frequently employed in his neighbourhood as a certain cure for ague, "by giving as much as will lie on a shilling, in a glass of white wine, two hours before the fit, and repeating it three times. It is held in great esteem among the poorer sort of people, and is said to have good success." By referring also to the account of Amygdalus *communis*, in our work, it will be seen that Bergius successfully treated ague with bitter almonds. Nurses occasionally put a leaf of the lauro-cerasus in pap, to relieve flatulence; while Baylies boasts of its virtues in hectic, and speaks of it as efficacious in attenuating the blood: that it was given during the last century as a remedy for consumption, is evident from a reference to it by Cullen, who says, "that it has been of no use in cases of *phthisis pulmonalis*, or in resolving obstructions of the liver, seems to be concluded upon too few experiments."

Not only every class of agents produces peculiar effects upon the living body, but every individual, besides the general properties of its class, is characterized by peculiar effects. The hydrocyanic acid is a narcotic, but it has not the property of lessening pain in general, nor of procuring sleep in a direct manner like opium; neither has it the power of controlling the pulse like Digitalis. In a large dose, short of fatal effects, it, as we have already hinted, occasions insensibility and extreme feebleness of the heart's action; in a smaller, vertigo, faintness, and perhaps rapidity of pulse, sickness, and a sense of constriction at the præcordia: in a still smaller, nausea only, with perhaps momentary vertigo, and even pain of the stomach. Although, in too large a dose it irritates the stomach, it has a remarkable power

* Numerous cases illustrative of the Efficacy of the Hydrocyanic or Prussic Acid in Affections of the Stomach, &c. By John Elliotson, M.D.

† Physical Experiments upon Brutes, p. 122. 1746.

when properly exhibited of soothing this organ when in a state of morbid irritability. In Dr. Elliotson's extensive practice at St. Thomas's Hospital, it has been satisfactorily proved, we understand, to be the best remedy in gastrodynia and in pyrosis; but its powers are most conspicuous in vomiting unconnected with inflammation of this organ. Frequently, as in pregnant women, it is observed to arrest, at the first few doses, perhaps at the very first, vomiting which had existed for several weeks, merely from morbid irritability; and hiccough also has frequently yielded to it. Yet, what is singular, it will not mitigate pain in the intestines. It cannot therefore be expected to relieve, nor does it even lessen pain generally, in other parts; and as a consequence, cannot be employed as a general anodyne.

The attacks of pain which occur in angina pectoris, and so closely resemble gastrodynia in situation and course, as probably to be mistaken, are said to be more relieved by it than by any other means.

It is also employed with advantage in the hooping, and what is called spasmodic cough; i. e. when there is no inflammation or organic disease; or where these exist, the cough is disproportionately violent. After proper antiphlogistic measures in inflammations of the chest, it has been useful; and occasionally in consumption, in palliating symptoms; but as it possesses no power over organic disease, it is not a cure for consumption, as some have too fondly wished; and a physician asserting in the nineteenth century, what time has proved to be incorrect, that it has cured several hundred cases, either shows a disregard of truth, or an ignorance of the symptoms and pathology of this fatal disease—for which he is alike culpable.

Nervous patients it sometimes soothes considerably. But, excepting in affections of the stomach, we may doubt whether it possesses any advantages over opium, properly administered; and in procuring sleep, relieving pain in general, or as a remedy for diabetes, it will be found a poor substitute.

When palpitation depends upon dyspepsia, it, in common with other symptoms, is greatly mitigated by this acid.

The external application of the prussic acid, greatly diluted,

has been recommended to soothe irritation of the skin. But it more frequently causes smarting sensations, and a degree of dryness, even when extremely diluted, that renders it worse than useless. Externally, though occasionally beneficial, it is infinitely inferior in its effects to the chloruret of soda, which, as a disinfecting agent, and as a cleanser of sloughing ulcers, we particularly recommend.

Dose.—The largest dose of the acid generally borne, prepared by Vauquelin's method, varies from one to five drops. We should begin with one drop, and increase the dose one drop daily, or every other day, till the symptoms yield, or signs of its disagreeing appear, such as severe vomiting, vertigo, or a sense of debility. The dose should be then reduced to what is borne with comfort. It may be continued any length of time without fear of accumulation of effect, or constitutional operation. It should not be given on an empty stomach; and when several doses are combined, the mixture should be well shaken previously to its administration.

PRUNUS DOMESTICA.—*Common Plum-tree.*

SPEC. CHAR. *Flower-stalks* solitary or in pairs. *Leaves* lanceolate-ovate, convolute while young. *Branches* without thorns.

Syn.—Prunus, n. 1079. *Hall. Hist. v.* 227.
Prunus sativa, *Fuchs Hist.* 403. *f.*
Prunus domestica, *Lin. Sp. Pl.* 680; *Wild. v.* 2. 995; *Fl. Brit.* 527; *Eng. Bot. v.* 25. *t.* 1783; *Hook. Scot.* 150; *Ger. Em.* 1497. *f.*; *Woodv. t.* 85.
FOREIGN.—*Prunier, Prune,* Fr; *Prugno; Susino,* It.; *Ciruelo,* Sp:; *Ameriera,* Port.; *Ppflaumen,* Ger.; *Plomman,* Swed.; *Sliwnik,* Russ.

THE plum-tree is frequently found growing wild in our woods and hedges, bearing flowers in April and May; but the country from whence it originally came has not been ascertained. "Whether," says Sir J. E. Smith, "all our cultivated plums may formerly have originated from the Prunus *insitia*, (Wild Bullace-tree,) its thorns having disappeared by culture, like those of the pear-tree, is a question which perhaps no botanist can ever solve." With respect to the varieties, Parkinson, in 1629, enumerates no fewer than sixty, "all of which," he says, "are to be had of my good friend Master John Tradescant, who hath wonderfully laboured to obtain all the rarest fruits he can hear of in any place in Christendom, Turkey, yea, or the whole world." Professor Martyn, in his edition of Miller's Gardener's Dictionary, also enumerates sixty varieties of the plum. We have now, however, nearly three hundred garden varieties.

The plum-tree rises about fifteen feet in height, and is destitute of spines. The leaves are pale green, oval, serrated, on short footstalks, and when young, convoluted and pubescent underneath; the stipules are pointed, and placed in pairs at the base of the footstalks. The flowers are large, on short peduncles, with a bell-shaped, deciduous calyx, and five, obovate white petals. The filaments are numerous, and inserted into the calyx: the germen is round, and supports a simple style. The fruit is an oblong drupe, internally consisting of a sweet fleshy pulp, and inclosing a smooth almond-shaped nut or stone.

Although in deference to our collegiate authorities, who follow Linneus, in associating the cherries and plums in the same genus, the Cherry-laurel has been treated of here as a species of *Prunus*, it may be as well to observe that modern botanists have found it advisable to separate the cherries from the plums, and to revert to those distinctions which were acknowledged by Miller, and which have always been popularly maintained; for not only do the cherries and plums differ in the shape of the stone, but the drupes of the former are smooth and shining, while those of the latter are pruinose, or covered with a resinous secretion, commonly called *bloom*. But even the cherries thus separated from the plums, both need and admit of a further subdivision, as they differ in properties and habit, as well as in structure. Hence the genus *Cerasus* has been divided by some botanists into two or three genera; but as the structural differences occur in the organs of vegetation, they are perhaps with more propriety considered as only forming subgeneric groups.

In (*Cerasus*, or *Cerasophora*,) the true cherry, the inflorescence is in tufts, or sertula, not in racemes. In (*Laurocerasus*,) the Cherry-laurel, the flowers and fruit are in racemes, and the leaves are evergreen. While in *Padus*, a group sometimes separated from Lauro-cerasus, and sometimes combined with it, although the inflorescence is racemose, the leaves are deciduous. These subgeneric distinctions are at least as important, if not more so, in an economical as in a systematic point of view, for prussic acid, which abounds in the *Lauro-cerasi*, even in their leaves, is almost absent from the true cherries, and in the intermediate *Padi*, it occurs only in very moderate proportions. —*Vide Outlines of Botany*, *&c.* 2265.

Qualities.—Three sorts of this fruit are ranked among the articles of the materia medica; they are all met with in our gardens, but the shops are supplied with them moderately dried from abroad. These are the Brignole plum, or Prunelle, brought from Brignole in Provence, of a reddish yellow colour, and a very grateful sweet, subacid taste; the common or French prunes, called by our gardeners the little black damask plum, and damsons, the larger damask violet plum of Tours, which is seldom

kept in the shops, its place having generally been supplied by the common prunes. All these fruits possess the same general qualities with the other summer fruits. When perfectly ripe, they are pleasant to the palate, and moderately nutritive; but when eaten too freely they are apt to occasion flatulence, griping, and diarrhœa. They are nearly inodorous, and contain chiefly mucus, saccharine matter, and malic acid.

Medical Properties and Uses.—The dried fruit, or prunes, are gently laxative, and enter as an ingredient into the *Confectio sennæ* of our pharmacopœias. They are advantageously employed as an article of diet, in costive habits, and in febrile and other diseases.

The fruit of the sloe, (Prunus *spinosa*,) is a powerful astringent; and the inspissated juice is a substitute for the Indian catechu. This juice is also largely used in factitious or adulterated port-wine, and the leaves are reckoned among the adulterations of tea in England.

Pl 118.



Erythræa Centaurium?

CXVIII

ERYTHRÆA CENTAURIUM.

Common Centaury.

Class V. PENTANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. ROTACEÆ, *Lin.* GENTIANÆ, *Juss.* GENTIANEÆ, *De Cand.* GENTIANACEÆ, GENTIANIDÆ, *Burn.*

GEN. CHAR. *Capsule* 2-celled. *Corolla* salver-shaped. *Anthers* becoming spiral. *Stigma* 2-lobed.

SPEC. CHAR. *Stem* nearly simple. *Panicle* forked, corymbose. *Leaves* ovate-lanceolate. *Calyx* half the length of the tube, its segments partly combined by a membrane.

Syn.—Centaurium minus, *Raii Syn.* 286; *Bauh. Pin.* 278; *Camer. Epit.* 428. *f.*
Centaurium parvum, *Ger. Em.* 547. *f.*; *Matth. Valgr. v.* 2. 19. *f.*
Centaurium, n. 638, *Hall. Hist. v.* 1. 288.
Gentiana Centaurium, *Lin. Sp. Pl.* 332; *Cull. Fr. t.* 253; *Fl. Dan. t.* 617.
Chironia Centaurium, *Fl. Brit.* 257; *Eng. Bot. v.* 6. *t.* 417; *Willd. Sp. Pl. v.* 1. 1068; *Curt. Lond. fasc.* 4. *t.* 22; *Woodv. t.* 157.

FOREIGN.—*Gentiane centaurelle*; *Petit Gentaurée*, Fr.; *Centaurea minore*, It.; *Centaurea menor*, Sp.; *Tausendgüldenkraut*, Ger.; *Solotnik-polewoi*, Russ.

THIS elegant annual grows spontaneously in most parts of Britain, in dry gravelly pastures, and in woods; flowering in July and August. Dr. Milne found it in great abundance in Charlton Wood, near the seven mile-stone, on the lower road to Woolwich; in the meadows about Eltham and Sidcup; in Shooter's Hill Wood; and in the chalk-pits at Northfleet. We also observed it plentifully in Birch Wood, Kent. A white variety was gathered by Mr. Lawson, near the medicinal well at Cartmel, in Lancashire; and is affirmed by the editor of the third edition of Ray's Synopsis, to be pretty common in Kent and in the isle of Sheppey. It occurs generally throughout Europe, as far northward as Sweden.

The plant rises from a small woody, fibrous root, to the height of ten or twelve inches. The stem is slender, erect, angular, leafy, sometimes branched at the upper part, and when very

luxuriant, from the base also. The leaves grow close to the stalk, in pairs, tending upwards, and are pointed, ovate, or elliptic-lanceolate. Those next the root are numerous, obovate, and form a tuft near the ground: they are all smooth, ribbed like those of plaintain or soap-wort, and of a bright green colour. The flowers, which open in the day-time and shut at night, are disposed in a beautiful more or less dense panicle, at the extremity of the forked branches. They have a smooth, striated, 5-cleft calyx, about half the length of the tube of the corolla, whose limb is of a brilliant pink or rose-colour, rarely white, and divided into five elliptical spreading segments, succeeded by an oblong cylindrical capsule, that opens by two valves, disclosing a number of small seeds. The filaments are thread-shaped, and furnished with oblong, yellow anthers, which become spiral or three-times twisted, after bursting, as represented by fig. *a*, on the plate. The germen is oblong, bearing a straight style, with a roundish bifid stigma.

The genus Erythræa, so named from the red colour of most of the flowers, contains four British species. It differs from Chironia, (which was originally appropriated to an African genus,) in habit, in the long tube and short limb of the corolla, and in other less important characters. The term Centaurium was bestowed on this species in honour of Chiron the Centaur, the celebrated preceptor of Achilles, who by the testimony of Pliny, (l. xxv. c. 6,) cured with it Hercules's foot, which had been wounded with a poisoned arrow.

Qualities.—The flowering tops are principally used in medicine; they are intensely bitter, without any peculiar smell. Their active powers are extracted both by water and alcohol. The decoction with water affords, by inspissation, a bitter extract.

Medical Properties and Uses.—Common, or Lesser Centaury, as it is sometimes called, has long been celebrated for its medicinal virtues, and is justly esteemed as one of the most efficacious of our indigenous bitters. It is a useful stomachic and antiseptic, and before the discovery of cinchona, was much employed as a useful tonic, in the cure of intermittent and continued fevers. As a bitter, it may be given with advantage in dyspeptic complaints, and in all cases where that class of remedies is indicated. The tops enter as an ingredient into the Portland powder; once in the highest repute as a remedy against the gout, but now very properly discarded from medical practice. The extract agrees in its medical properties with that of gentian, and being less expensive, is perhaps preferable. The *dose* of the powder is from ʒfs to ʒj; of the extract gr. v. to ϑj; of an infusion, made by macerating ʒij of the dried tops in lb.fs of boiling water, ʒij may be taken three or four times a day.



Rhamnus catharticus.

RHAMNUS CATHARTICUS.

Common Buckthorn.

Class V. PENTANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. DUMOSÆ, *Lin.* RHAMNI, *Juss.* RHAMNEÆ, *De Cand.* RHAMNACEÆ, *Burn.*

GEN. CHAR. *Calyx* funnel-shaped, bearing the petals. *Berry* of several cells. *Seeds* with a cartilaginous strophiole.

SPEC. CHAR. *Leaves* ovate, serrated. *Flowers* 4-cleft, dicœcious. *Thorns* terminal *Berry* with four seeds.

Syn.—Rhamnus solutivus, *Ger. Em.* 1337. *f.* 1. 2; *Dod. Pempt.* 756. *f.*
Rhamnus *n.* 824; *Hall. Hist. v.* 1. 336.
Cervispina, *Cord. Hist.* 175. *f.*
Spina infectoria, *Matth. Valg. v.* 1. 143. *f*; *Camer. Epit.* 82 *f.*
Rhamnus catharticus, *Lin. Sp. Pl.* 279; *Willd. v.* 1. 1092; *Fl. Brit.* 260; *Eng. Bot. v.* 23. *t.* 1629; *Hook. Scot.* 80; *Raii Syn.* 466; *Bauh. Pin.* 478; *Woodv. t.* 114.

FOREIGN.—*Nerprun*; *nerprun purgatif ordinaire*, Fr.; *Ramuno catartico*; *Spino cervino*, It.; *Ramno catartico*; *espina de ciervo*, Sp.; *Escambrociero*, Port; *Gemeine Kreuzdorn*, Ger.; *Getappel*, Swed.: *Korsbœrtorn*, Dan.; *Pridoroschnaja igolka*, Russ.

BUCKTHORN is, perhaps, as well known among herbalists and rustic practitioners as any indigenous medicinal plant of Great Britain. It has been long celebrated for the cathartic qualities of its berries, which are gathered by the common people in some places in considerable quantities, and the juice expressed for the use of the apothecaries. It grows wild in hedges, groves, and thickets, flowering in May, and ripening its fruit in September. It is rather uncommon in the neighbourhood of London; but Dr. Milne found it in some lanes betwixt Plumstead and East Wickham; in a chalk-pit betwixt Gravesend and Chatham, and in copses above Purfleet. The specimen from which our figure was designed, grew in the lane leading from the Fox and Hounds public-house to Darenth Wood, two miles beyond Dartford, in

Kent. We have also observed it in great abundance in the hedges near Thames Ditton; and Mr. W. Anderson, of the Botanic Garden, Chelsea, informs us it grows plentifully about Norwood, in Surrey.

Buckthorn is a shrub, which rises to the height of seven or eight feet, with a smooth dark-brown bark, and yellowish wood. The branches are alternate, or nearly opposite, spreading, and each terminating in a strong spine, after the first year. The leaves are simple, entire, ribbed, smooth, finely serrated, and of a bright green colour; the earlier ones downy, and in tufts from the flowering buds; those on the young shoots, opposite, and smooth. The flowers are small, sustained on pedicels, and stand in thick clusters on the extremities of the last year's branches. They are generally of different sexes on distinct plants; the fertile flowers, with the rudiments of stamens, narrow petals, and a deeply four-cleft style; the barren ones with an abortive germen, and broader petals. The anthers are small, roundish, on short awl-shaped filaments, and inserted in the mouth of the four-cleft calyx, opposite to each petal. The berries, which succeed the germen in the female flowers, are black when ripe, globular, of the size of a pea, and contain a green pulp, with *four* cells, and as many seeds, that are smooth, elliptical, convex on one side, and flattened on the other. By this last character they are easily known by druggists, from the fruit of the Rhamnus *Frangula*, which has only *two* seeds, and is supposed to be less active. Fig. (*a*) represents a male flower; (*b*) female flower; (*c*) a stamen; (*d*) the fruit; (*e*) the section of a berry, showing the four cells; (*f*) the seed.

There are two British species of Buckthorn: Common Buckthorn, already described, and Alder Buckthorn, or Berry-bearing Alder, (R. *Frangula*.) The latter is a shrub, which, like the preceding, grows to a considerable height, with smooth entire leaves, and flowers in May. It is destitute of thorns; and the berries, which ripen in July, are dark purple, each containing two large yellowish seeds. This plant formerly obtained a place in the foreign dispensatories, under the name of *Frangula*. The inner bark, the only part used in medicine, when dried is a dras-

tic purgative; emetic, when green. The berries gathered before they are ripe dye wool green, and yellow; when ripe, blue-grey, blue, and green. The bark dyes yellow, and, with preparations of iron, black.

The species usually cultivated, or introduced as objects of curiosity are, — the Turkey-berry buckthorn, (R. *infectorius;)* the shining-leaved buckthorn, or common jujube, (R. *zizyphus;*) the common alaternus, (R. *Alaternus*;) the pubescent rhamnus, or Bahama red-wood, (R. *colubrinus;*) the common Christ's thorn, (R. *Paliurus;*) the pointed-leaved buckthorn, (R. *anoplia;*) and the Syrian Christ's-thorn (R. *spina Christi*.)

The first is a native of the south of Europe. It is frequent in rough stony places in Greece, and is regarded by Dr. Sibthorp as the Λυκιον, *Lycium*, of Dioscorides. The unripe berries are much used for dyeing, and are imported into England under the name of French berries. They are chiefly used for topical dyeing in calico printing; but the colour which they communicate is very fugitive; they are also used to give the colour to Turkey leather, or yellow morocco. This shrub is very nearly related to the R. *catharticus*, but grows procumbent, not erect, and the leaves are smaller and narrower.

The fruit of the shining-leaved buckthorn, or common jujube, is sold in the market at Canton during the autumn. It is about the size of an olive, of a yellowish-red colour, sweetish and clammy. In Italy and Spain it is served up at table, in desserts during the winter season, as a dry sweetmeat. It was formerly kept in the shops, under the name of *jujubes*, and recommended in coughs and other pulmonary complaints, but has now fallen into disuse in England, although in France it is still esteemed.

The natives of Siberia use the wood of an unarmed species, the Rhamnus *Erythroxylon*, or Siberian Red-wood, to make their images, on account of its hardness and colour. According to Osbeck, the poor in China, where the shrub is a native, use the leaves of the R. (now *Segeretia*) *Theezans*, as a substitute for the genuine tea, and it is even called by them *Tia*. Another species (R. *Paliurus*, or *Paliurus aculeatus*,) which is affirmed by travellers to be one of the most common shrubs in Judea,

is supposed by some to be the plant from which the crown of thorns put upon the head of Christ was composed; but Dr. Hasselquist is rather disposed to think it was the R. *spina Christi* of Linneus. The true Lotus of the Greeks (Rhamnus or *Zizyphus Lotus*) is one of the most common shrubs in many parts of Africa. The fruit is described by Park. as a small farinaceous berry, of a yellow colour, and delicious taste.

Qualities.—The odour of the buckthorn-berries is faint and unpleasant; and to the taste they are bitter, acrid, and nauseous. They are said to contain acetic acid, mucilage, sugar, and an azotized substance.

Medical Properties and Uses.—The juice of the berries is a violent griping, drastic purgative, capable of exerting very injurious effects; and although occasionally employed as a domestic remedy, it is now chiefly used in veterinary practice. A syrup is still prepared from buckthorn-berries, as directed by the London and Edinburgh colleges. The London form is preferred on account of the aromatics which enter into its composition, preventing its griping effects. It is, however, a violent remedy, and produces most unconquerable dryness of the mouth and throat, and intolerable thirst. The *dose* is from six drachms to an ounce.

From the inspissated juice of the ripe berries, with a very small addition of alum, is obtained that green colour so well known by the name of *verte-de-vessie* or *sap green*. Sometimes it is prepared by adding eight pounds of lime-water to twelve pounds of the expressed juice, and six ounces of gum arabic; which mixture is afterwards evaporated to the consistence of an extract, and dried for use.

Pl. 120.



Ulmus campestris.

ULMUS CAMPESTRIS.

Common Small-leaved Elm.

Class V. PENTANDRIA.— *Order* II. DIGYNIA.

Nat. Ord. SCABRIDÆ, *Lin.* AMENTACEÆ, *Juss.*
ULMACEÆ, *Mirb.* CELTIDEÆ, *Rich.*

GEN. CHAR. *Corolla* 0. *Capsule* compressed, membranous, superior.

SPEC. CHAR. *Leaves* doubly serrated, rough. *Flowers* nearly sessile, 4-cleft. *Capsule* oblong, deeply cloven, naked.

Syn.—Ulmus minor, folio augusto scabro, *Good in Ger. Em.* 1480 *f.*; *Raii. Syn.* 469.
Ulmus, *Dod. Pempt.* 137 *f.*
Ulmus campestris, *Lin. Sp. Pl.* 327; *Willd. v.* 1. 1324; *Fl. Brit.* 281; *Eng. Bot. v.* 27. *t.* 1886; *Woodv. 2d. ed.* 710. *t.* 242.

FOREIGN.—*Orme*, Fr.; *Olmo*, It. Sp. and Port.; *Ulmrinde*, Ger.; *Alm*, Dan. and Swed; *Olm*, Dut.; *Ilim*, Russ.

THE common small-leaved elm is generally understood to be indigenous to the south of England, though the fact has been doubted by Evelyn and others. Several superstitious customs were practised on this and other elm-trees by our Saxon ancestors. A canon of king Edgar, in the tenth century, may be thus literally translated. "We decree that every priest shall anxiously advance Christianity, entirely abolish all heathenism, and forbid tree-worship, divination with the dead, omens, charms with songs, man-worship, and many other illusions which are practised in asylums on elms, (hence perhaps the name Witch or Wych-Elm,) and on various other trees, by which many are perverted who ought not so to be." Dr. Hunter justly remarks, there can be no stronger proof of its being known at a very early period, than that many compound names of places, of which the word "elm" forms a part, are to be met with in "Doomsday Book," the drawing up of which was finished in 1086.

The small-leaved elm grows abundantly in the woods and hedges near London, flowering in April, long before the foliage expands. It is a lofty tree, sending off many round, spreading, crooked, leafy branches, and is covered with a rugged dark-brown bark. The leaves are elliptical, contracted toward each end, doubly serrated, and unequal at the base; they are very rough, wrinkled, and veined, stand alternately on footstalks, and are of a dark green colour. The flowers are small, and grow in numerous dense, round, dark-purple clusters, from the sides of the branches before the evolution of the leaves, each flower being nearly sessile, with an oblong fringed bractea at its base. The calyx is inferior, turbinate, wrinkled, permanent, and divided at the limb into four oblong obtuse segments of a pale brownish red colour. There is no corolla. The filaments are four or five, twice as long as the calyx, and bearing dark-purple anthers. The germen is oblong, compressed, and supports two styles, which bend outwards, and are terminated by the stigmas, which consist of a downy line along the upper surface of each style. The flowers are succeeded each by an oblong, wedge-shaped flat pale-brown capsule, which has a deep sinus at the extremity, and incloses a single seed. Fig. (*a*) represents a flower with its bractea magnified; (*b*) the styles; (*c*) the capsules; (*d*) *Scolytus destructor* of the natural size.

Of the elm there are about fifteen species, four of which, besides the *campestris*, are natives, or naturalized in Britain, viz.—the broad-leaved elm, called also the wych hazel, (U. *montana*;) the common cork-barked elm, (U. *suberosa*;) the Dutch cork-barked elm, (U. *major*;) and the smooth-leaved, or wych elm, (U. *glabra*.) In the first of these, the leaves are larger than in any of the native species; the bark is smooth and even, and the flowers are stalked and in looser tufts. The common cork-barked elm has stalked, four or 5-cleft flowers, and like the Dutch elm, (which has sessile flowers,) is chiefly remarkable for its quick growth and rough corky bark. The wych elm, which is very common in Essex, has small leaves, smooth on both sides, nearly sessile, 5-cleft flowers, and obovate, deeply cloven capsules. Linnæus confounded all the European elms under the name of Ulmus *campestris*.

The elm attains a large size, and lives to a great age. Mention is made of one planted by Henry IV. of France, which was standing at the Luxemburg Gardens in Paris at the commencement of the French revolution. One at the upper end of Church-lane, Chelsea, (said to have been planted by Queen Elizabeth,) was felled in 1783. It was thirteen feet in circumference at the bottom, and one hundred and ten feet high. Mr. Coxe mentions an ancient elm at Raglan Castle, in Monmouthshire, which was twenty-eight feet five inches in circumference near the root. Piffes' elm, near the Boddington Oak, in the vale of Gloucester, was, in 1783, about eighty feet high, and the smallest girth of the principal trunk was sixteen feet. From the planting of Sir Francis Bacon's elms, in Gray's Inn Walk, in 1600, and their decay about 1720, one would be disposed to assign the healthy period of the elm to be about one hundred and twenty years. The health of these must have been, however, affected in some degree by the smoke of London. The superb avenue called the " Long Walk," at Windsor, was planted at the beginning of the last century. Most of the trees have evidently passed their prime. The most profitable age of elms, both for quantity and quality of timber, is supposed to be about fifty or sixty years. The predominance of resin insoluble in water, and not liable to be acted on by the atmospheric air, has been assigned as the cause why the pine and the larch are more durable than the silver fir and the spruce. " It is possible," says Miller, " that the elm is injured by too much humidity in the soil upon which it grows; and the Dutch elm, which is usually classed as a different species from the common elm, may be merely the common one debased in the humid soil of Holland."

The elm has been always considered as one of the trees which can be most safely transplanted after attaining a considerable size. Evelyn gives several accounts of this species being thus removed into other soils. In the year 1816, a much improved mode of transplanting this and other forest trees was introduced by Sir Henry Stewart, of Allanton, for an account of which we must refer our readers to his valuable work, " the Planter's Guide."

The *culture* of the elm is effected in different ways; as by seed, suckers, layers, and grafts. All the sorts and varieties are of hardy growth, and will succeed perfectly well in any common soil and exposure, but delight most in a deep rich earth of a stiffish loamy nature, which is rather inclined to moisture, the English sorts having the best situations and soil, and the Wych and Dutch kinds those which are inferior in these respects. The common small-leaved elm is of slower growth than our other wild species, with a harder, more durable, and consequently more valuable wood, which is preferred for most kinds of wheel-work, pipes for conducting water under the ground, pumps, coffins, and various other useful purposes.

The elm-tree is liable to be injured, and is sometimes entirely destroyed by a minute beetle, (Scolytus *destructor*,) which, in its preparatory state of metamorphosis, feeds upon the soft inner bark. This insect, which inhabits the elms of France and Germany, as well as England, was particularly prevalent, and caused incalculable mischief in St. James's and Hyde Parks a few years ago. The leaves of the trees infested by the scolytus first become yellow, the trees themselves then die at the top, and ultimately altogether perish. "From March to September," says Mr. Curtis, (to whose valuable and elegant work we are indebted for the accompanying figure,) "the female may be found upon the trunks of elm-trees, making her way through the bark; after which she proceeds between the bark and the wood; forming a passage, and depositing her eggs on each side in her course till she is exhausted, when she dies, and may generally be found at the extremity of the channel; when the eggs which are deposited being close to each other, hatch, the larvæ beginning to feed, working nearly at right angles from the path of the parent, and proceeding almost parallel to each other, as expressed in the engraving."

In order to check the ravages occasioned by these formidable little animals, Mr. Macleay recommends the infected trees to be brushed over in March, with a mixture of tar and train oil, a certain height above ground, which will destroy the larvæ.* An

* See Macleay in *Edinburgh Philos. Journ.* No. XXI. July 1834, p. 123. Curtis *British Entomology*, v. 1. t. 43.

insect, similar in its economy, but belonging to a different genus, the Bostrichus *typographus* of Fabricius, and known in Germany under the name of *Wurm trokniss*, (decay caused by worms,) occasioned terrible devastation among the pines in the Hartz forest, about the year 1783.

Qualities and Chemical Properties.—The inner bark, which is the part used in medicine, has a yellowish colour, and a mucilaginous bitter astringent taste, without smell. The bark in the spring is most advantageously stripped from the small, but not from the smallest branches; and in autumn from the branching roots. The decoction, when evaporated, leaves a little semi-transparent substance, soluble in water, but insoluble in alcohol and ether, which Dr. Thomson, in his Dispensatory, regards as *ulmin*; or rather, as a peculiar modification of mucus, combined with extractive, gallic acid, and super-tartrate of potass. *Ulmin* is the name given to a peculiar substance which was discovered by the celebrated Klaproth, in the bark of the elm. It exists in the bark of almost all trees, but is generally obtained by spontaneous exudation from the elm. It may be prepared by acting on elm-bark by hot alcohol and cold water, and then digesting the residue in water which contains an alkaline carbonate in solution. In the solid state it has the appearance of gum. It has no taste, and is soluble, though sparingly, in water and alcohol. The alkaline carbonates dissolve it more abundantly, and it is precipitated from its solution in them by acids and metallic salts. Dobreiner states, that gallic acid is converted into ulmin, by dissolving it in ammonia, and exposing the solution to oxygen gas. Ulmin has not hitherto been applied to any particular use.

Medical Properties and Uses.—The decoction of elm-bark has been recommended in various cutaneous diseases; particularly of the herpetic and leprous kind. Banau recommends its use in fluor albus, chronic rheumatism, scrofulous affections, tinea capitis, scurvy, and in old inveterate ulcers. In Vol. II. of the Medical Transactions, five cases of inveterate eruptions are narrated by Dr. Lysons, as having been cured by this remedy, but it is doubtful whether adjuncts are not the chief causes of

relief, Dr. Lettsom also cured what he supposed to be the *lepra ichthyosis* of Sauvages by it; but it is now fallen into disuse as a remedy of very little power. We think, however, that it deserves more extensive trials before being discarded from our materia medica. The Decoction (*Decoctum Ulmi* of the pharmacopœias) is made by boiling four ounces of the inner bark in four pints of water down to two pints. *Dose* from four to six or eight ounces twice a day.

The bark of the elm dried and ground to powder has been mixed with meal, in Norway, to make bread in times of scarcity. The leaves also afford a pleasant nourishment to cattle, and in some parts of Hertfordshire the poor people gather them in sacks for this purpose.



Diosma crenata.

DIOSMA [*vel* BAROSMA] CRENATA.

Crenated Diosma.

Class V. PENTANDRIA.—*Order* I. MONOGYNIA.

Nat. Ord. MULTISILIQUÆ, *Lin.* RUTÆ, *Juss.* RUTACEÆ, *De Cand.* RUTACEÆ RUTIDÆ, DIOSMEÆ, *Burn.*

GEN. CHAR. *Calyx* 5-parted. *Nectary* or disk perigynous, lobed, or bearing five scales, sometimes resembling filaments, and sometimes petaloid. *Capsules* three or five, connected, bivalved and mucronate at the apex.

SPEC. CHAR. *Leaves* ovate-lanceolate, crenate, punctured underneath; *flowers* solitary.

Syn.—Hartogia betulina, *Berg. Cap.* 67.
Diosma crenata, *Lin. Sp. Pl.* 287; *Amæn. Acad.* 6. *p.* 308; *Houttuyn Lin. Syns.* 3. *p.* 286; *Willd.* 2. 1138; *Thunb. Dissert. p.* 14; *Ait. Hort. Kew. v.* 2. *p.* 32. *Bot. Cab. n.* 404.
Barosma crenata, *Bartling.*

ALL the species of this genus are shrubs, and natives of the Cape of Good Hope. The subject of the present article was introduced by Mr. Francis Masson in the year 1774. It forms a thin branching shrub, flowering in its native soil throughout August, September, and October. It is still rare in our collections; but blossoms occasionally in March, at Messrs. Loddiges, at Hackney. For its culture the soil should be sandy peat, and the plant requires the usual greenhouse protection in winter.

The plant is perennial, erect, everywhere smooth, and rises about two feet high; the branches are round or somewhat angular, loose, wand-like, and of a purplish colour. The leaves are opposite, scattered, ovate, pointed, of a dark green colour above, paler underneath, crenated, and full of small transparent punctures, particularly at the edges between each tooth. The flowers are solitary on short pedicels, delicate, white, or of a pale reddish

tint, and arise at the ends of short opposite lateral shoots. The calyx consists of five deep ovate, acute, permanent segments. The corolla is composed of five elliptic oblong bluntish segments, slightly spreading. The nectaries are five linear-lanceolate scales crowning the germen; or, in other words, the disk is perigynous, lobed, or bearing filamentoid or petaloid processes. The filaments are five, awl-shaped, bearing ovate, incumbent anthers. The germen is superior, and turbinate; the style erect, the length of the stamens, with a simple stigma. The capsule is ovate, containing an oblong solitary seed, inclosed in an elastic coat.

The old genus *Diosma* has been subdivided by modern botanists, and the Buchu belongs to the subdivision now called *Barosma*—a change of appellation well deserved by its sensible qualities, for the scent of its infused leaves is most disgusting, and little accordant with the etymological signification of its former name, which is said to be a compound of διος and οσμη.

Qualities and Chemical Properties.—The odour of the whole of this plant is very strong and peculiar. It affords an essential oil, which resembles a mixture of oil of rue, cubebs, and camphor. The extractive matter is slightly bitter and mucilaginous. It yields to water, on long-continued boiling, a quantity of mucilage; and the essential oil, which is imparted to boiling water by infusion, is dissipated by decoction. To an analysis by M. Cadet, jun. the leaves of this plant yielded,*

Essential oil .	0.665
Gum . .	21.17
Extractive . .	6.17
Chlorophylle .	1.10
Resin . .	2.151

Medical Properties and Uses.—To this plant the natives of Southern Africa ascribe incredible virtues in numerous diseases, and of a very opposite nature. To Dr. Reece, of Bolton Row, we are indebted for the Krameria *triandra*, as an article of our authorized materia medica, which as an astringent tonic is

* Journ. Chim. iii. 44.

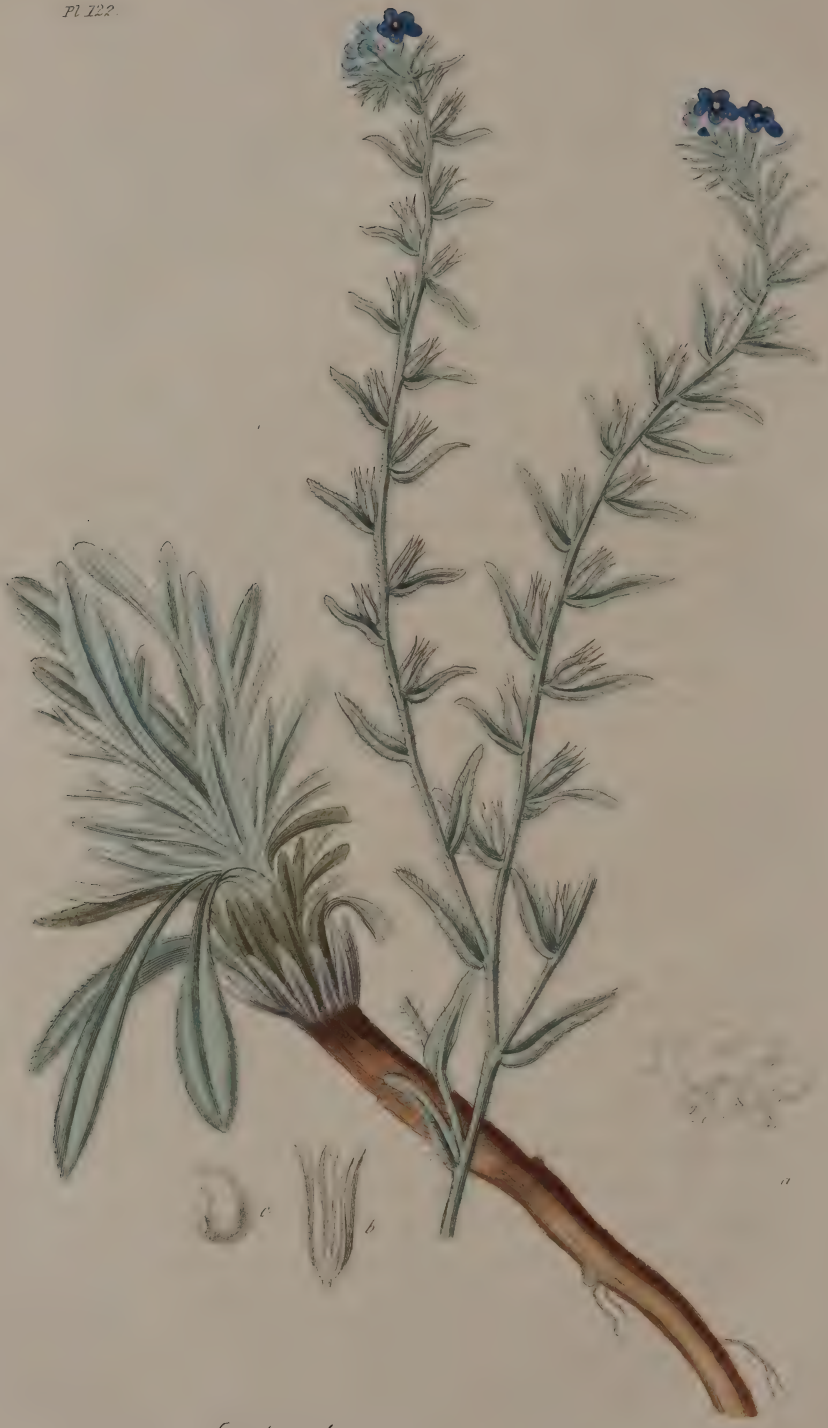
much prized by Sir H. Halford, at whose recommendation it found a place in our pharmacopœia. The former gentleman, whose therapeutical knowledge is deservedly esteemed, was also the first to excite the attention of British practitioners to the D. *crenata;* and as the subsequent experience of several able men in Ireland has confirmed its efficacy, it now ranks amongst the officinal drugs of the Dublin pharmacopœia. For several years it appears to have been successfully prescribed in Holland, for rheumatism and inflammatory affections of the mucous membranes, particularly of the bladder, urethra, prostate gland, and rectum. The natives of the Cape, from whom the Dutch derived their knowledge on the subject, are partial to the spirit of buchu, made by distilling the leaves in the dregs of wine, which they term buchu-brandy, and regard as a sovereign remedy for all chronic diseases, and even acute ones, of the stomach and bladder, but especially spasmodic affections of the stomach and intestines. By referring to Burchell's travels in Africa, it will be found, that the Hottentots apply a decoction of buchu leaves to fresh wounds, and also use them as a cosmetic, which is referred to by Thunberg, when speaking of the uses of the plants belonging to this genus: " Inserviunt imprimis *uniflora*, *pulchella*, *crenata*, et *betulina*, quarum folia inter lapides in pulverem redigunt Hottentotti, eoque cognomine Buchu, corpus pinguedine ovina arte inunctum adspergunt, unde odor eorum graveolens et insuetus valde ingratus."*

The Diosma crenata appears to be an excellent aromatic stomachic, and is very efficacious as a diuretic. It also exerts very powerful effects on the urinary apparatus, as in irritative affections and chronic inflammations of the bladder and urethra, which so often follow mismanaged gonorrhœa, or are the consequences of the retention of urine, diseased prostate gland, stricture of the urethra, the action of calculi, or the rude use of the bougie. Dr. M'Dowall † has given many cases of these kinds in which it has been eminently successful, and the correctness of his assertions is fully borne out by Dr. Cumming, of Dublin.

* Dissert. Botan. de Diosma, p. 20. † Vide Dublin Medical Transactions.

We are also in the habit of employing the infusion for the same diseases, and are generally well satisfied with the results. An eminent general practitioner has favoured us with the following observations, with which we conclude: "I have often found the infusion of buchu-leaves, taken internally and applied externally, extremely beneficial for rheumatism. In one case of long standing chronic rheumatism, the patient, an elderly man, was suffering severely in the loins and extremities, as also from a most distressing irritative affection of the bladder and urethra. A wine glassful of the infusion, made with an ounce of the leaves to a pint of boiling water, taken three times a day, not only reduced the rheumatic pains, but entirely removed the complaint of the bladder and urethra, which had been ascribed to a diseased state of the prostate gland. These sedative effects, so remarkably displayed, induced me to try it in similar affections of the rectum, and the favourable results fully confirm the opinion I had anticipated."

Off. Prep.—Inf. Diosmæ crenatæ. D.



Anchusa tinctoria L.

CXXII

ANCHUSA TINCTORIA.

Dyer's Alkanet.

Class V. Pentandria.—*Order* I. Monogynia.

Nat. Ord. Asperifoliæ, *Lin.* Borragineæ, *Juss. De Cand, &c.* Boraginaceæ, Boraginidæ, *Burn.*

Gen. Char. *Corolla* closed with concave obtuse valves; funnel-shaped; tube straight, tumid below. *Akenia* concave at the base.

Spec. Char. Downy; *leaves* lanceolate, obtuse; stamens shorter than the corolla.

Syn.—Anchusa Monspeliana, *Bauh. Hist. v.* 3. 534.
Anchusa parva, *Lob. Icon.* 578.
Anchusa prima, *Matth. Valgr. v.* 2. 341.
Lithospermum tinctorium, *Andr. Repos. t.* 576.
Buglossum radice rubrâ, sive Anchusa vulgatior, *Tourn. Inst.* 134.
Anchusa tinctoria, *Desfont. Atlant. v.* 1. 156; *Ait. Hort. Kew. ed.* 2. *v.* 1. 290; Linn. *Fl. Græc. Sibth. v.* 2. t. 166.
Αγχουσα, *Dioscor.*

Foreign.—*Le buglos teignante*, Fr.; *Ancusa tintoria*, It.; *Anchusa de tinte*, Sp.; *Farber-Ochsenzunge*, Ger.; *Orkanette*, Dan. and Swed.

This plant is a perennial, a native of the south of Europe, and was found by Sibthorp in Greece. It is sometimes raised in our gardens; but the roots do not acquire in this country the fine red colour for which the foreign alkanet is prized. It has long been extensively cultivated for medicinal purposes in the neighbourhood of Montpellier, in France. It flowers from June to October.

The root is woody, long, round, tapering, branched, and covered with a blackish-red coloured bark. The herb is all over rough with short bristly hairs, proceeding from small cartilaginous tubercles or warts. Several stems arise from one root; they are round, leafy, branched, panicled above, and about a foot or eighteen inches high. The leaves are oblong, entire, convex above, and keeled underneath; the radical ones forming a tuft on the ground, elongated and tapering towards the base; the rest smaller, alternate, slightly dilated at the base, and partly

embracing the stem. The spikes are generally in pairs, bent towards the top, many-flowered, with ovate bracteas, twice the length of the calyx. The calyx is reddish, with short hairs, and divided into five oblong-lanceolate segments. The corolla is funnel-shaped, consisting of a straight cylindrical tube, tumid at the lower part, closed at the mouth with five small roundish convex valves, and divided at the limb into five deep, obtuse, equal segments, of a deep azure colour. The filaments are shorter than the corolla, bearing roundish anthers: the carpels four, with awl-shaped styles, nearly as long as the tube, with a small notched stigma. The seeds are oblong, and rough with tubercles. Fig. (*a*) the flower somewhat magnified, showing the stamens and arched valves; (*b*) the calyx and pistil a little magnified; (*c*) the fruit.

Qualities and Chemical Properties.—Alkanet root, as met with in commerce, is inodorous and nearly tasteless. The red colouring matter, according to Pelletier, with which the cortical part abounds, is of a brownish red colour, runs into a mass, which breaks with a resinous fracture, is soluble in alcohol, ether, and fat oils, which it colours red, while they preserve their transparency. It imparts scarcely any colour to water. It forms blue combinations with potass, soda, barytes, strontia, and lime: is decomposed by the action of concentrated sulphuric acid; and is converted into oxalic acid by nitric acid. When precipitated from its alcoholic menstrua by the aid of metallic solutions, it forms an excellent varnish. This colouring matter is considered by John to be a peculiar proximate principle which he has called *Pseudo-Alkannin*. M. Chevreul has lately discovered in the Anchusa tinctoria, and in the root of the Viburnum *Opulus* a new acid, which he terms *Phocénique*. Sometimes the roots of the Onosma *echioides*, and O. *tinctoria*, are substituted for the Anchusa *tinctoria*. *Anchusa Virginiana* and *Echium rubrum* have roots almost equally rich in colouring matter with the true alkanet, and are sometimes used instead of it. Bergius states that the roots of the Borago *officinalis* are occasionally boiled in a decoction of Brazil wood, and sold for alkanet: the fraud, however, is easily detected by inspection, and by the substitute failing to yield its colour to the fixed oils.

Uses.—This plant was formerly administered as an astringent; but has given place to medicines much more worthy of regard. It is useless, excepting as a colouring matter for oils, lip-salve, and plasters.



Arnica montana L.

ARNICA MONTANA.

Mountain Arnica, or Leopard's-Bane.

Class XIX. SYNGENESIA.—*Order* II. POLYG. SUPERFLUA.

Nat. Ord. COMPOSITÆ DISCOIDEÆ, *Lin.* CORYMBIFERÆ, *Juss.* ASTERACEÆ, *Burn.*

GEN. CHAR. *Receptacle* naked. *Seed-down* simple. *Involucrum* with equal leaflets. *Corollules* of the ray having five filaments without anthers.

SPEC. CHAR. *Leaves* ovate, entire; stem leaves opposite, in pairs.

Syn.—Alisma, *Matth. Diosc.* 934; *Bauh. Hist.* 3. *pars* 1. *p.* 20.
Chrysanthemum latifolium. *Dodon.* 263; *Ger. Em.* 742.
Caltha alpina, *Tabern.* 337. *ed. Germ. p.* 714.
Doronicum Plantaginis folio alternum, *Bauh, Pin.* 185.
Doronicum austriacum quartum, *Clus. Pan.* 522.
Doronicum oppositifolium, *Lamar. Dict.* 2. *p.* 312.
Arnica foliis conjugatis ovatis integerrimus, *n.* 90. *Hall. Hist.*
Arnica, *Collin Obs. v.* 1. cum icone.
Arnica montana, *Lin. Sp. Pl.* 1245; *Willd.* 3. 2406; *Hort. Kew. ed.* 2d. *Fl. Dan. t.* 63; *Scop. Carn. n.* 1086; *Gærtn. Fruct.* 2. *p.* 451. *t.* 173. *f.* 1; *Leers Herb. n,* 651; *Villars Dauph.* 3. *p.* 207; *Fl. Franc.* 4. *p.* 175; *Bot. Mag. v.* 42. *t.* 1749; *Woodv. p.* 10.

FOREIGN.—*Doronic à feuilles opposées,* vulg.; *Le tabac des Vosges,* Fr.; *Arnica montana,* It.; *Arnica; tabaco de montana,* Sp.; *Wolverley; Wolferley,* Ger.; *Wolverley,* Dan.; *Fibler,* Swed.; *Valkruid,* Dut.

THIS is a hardy perennial, a native of the northern parts of the continent of Europe and Siberia, delighting in moist shady situations, and flowering in June and July. It is also found on the Pyrenees, and was cultivated by Philip Miller in 1759. The specimen from which our figure was drawn blossomed this season at the Botanic Garden, Chelsea, and for it we are indebted to Mr. Anderson, the curator.

The root is blackish, woody, abrupt at the lower end, and furnished with many long slender fibres. The stem, which rises about a foot in height in our gardens, but not more than six inches in alpine situations, is simple, obscurely angular, striated, rough, hairy, and terminated by two or three upright peduncles, each bearing one flower, of a deep yellow colour, tinged with brown. The radical leaves are ovate, entire, ciliated, and obtuse; the cauline ones stand in opposite pairs, and are lance-shaped. The involucrum is cylindrical, and composed of fifteen or sixteen rough hairy lanceolate scales, of a dingy green colour, and purple at the points. The florets of the disc are very numerous, tubular, with a five-lobed margin; those of the radius about fourteen, ligulate, striated, three-toothed, and hairy at the base. The fruit is oblong, blackish, hairy, and crowned with a straw-coloured down.—Fig. (*a*) represents a floret.

Qualities and Chemical Properties.—The *leaves* of the dried plant have a pleasant aromatic odour, and excite sneezing, while their taste is somewhat aromatic, bitter, and pungent. The root is bitter and acrid; the flowers have a fetid smell and a penetrating bitter taste; and according to an analysis by MM. Chevalier and Lassaigne, the following constituents were obtained.

A resin, having the odour of the flowers.
A bitter nauseous matter, resembling *cytisine*.
Gallic acid.
Yellow colouring matter.
Albumen.
Gum.
Muriate of potass.
Phosphate of ditto.
Trace of sulphur.
Carbonate of lime.
A trace of silex.

Medical Properties and Uses.—In over doses the Arnica montana exerts peculiar effects on the animal economy. It in duces great anxiety, particularly in the region of the stomach,

followed by pinching pains, nausea, a flow of saliva, and sometimes vomiting. If it reach to the intestines, it induces colic pains, which are rarely followed by alvine evacuations. These effects generally pass off soon, without leaving any derangement of the system, provided the dose be not too large. If it be, the brain and spinal marrow are peculiarly affected, twitchings and involuntary motions of the extremities generally preceding the other effects on the nervous system.

Dr. Collin of Vienna, endeavoured in the year 1773 to recall this plant from disuse by the publication of numerous cases of putrid fever, intermittents, palsies, tremors, and amaurosis, from which it would appear to be a very powerful and successful remedy.

Dr. Crichton states, that in the worst stages of typhus, treated by Stoll in the hospital at Vienna, it succeeded wonderfully well when the pulse was exceedingly weak, small, and quick, and when petechiæ had appeared; and even when the patients seemed exhausted by a colliquative diarrhæa, this remedy generally produced the happiest effects.

Dr. Collin says that he has cured thirty-six quotidian, forty-six tertian, and fifty-eight quartan agues with the extract of arnica, a drachm of which was given in the course of the day. Its success in these cases is confirmed by the testimony of Professor Sebold of Prague.

In Jutland it is a popular remedy for ague, and Dr. Manger states that he has experienced the best effects from an infusion of about half an ounce of the flowers, drank two hours before the access of the paroxysm. It has also been given in tremors, palsy, and amaurosis, with different degrees of success; and as it evidently possesses some power over the nervous system, it is deserving of the attention of British practitioners, although it may not be quite so potent a medicament, as by some persons it has been esteemed.

The whole plant is generally used in infusion or decoction, in the proportion of an ounce of it to a pint and a half of water, which quantity may be given in doses of a cupful in the course of twenty-four hours.

Of the flowers, two or three drachms are generally sufficient; although an ounce has been taken without injury in the course of the day. The extract made from the whole plant is preferred by Dr. Crichton, who gives a drachm in the same time.

In addition to the physical effects which we have already adverted to, it is stated to be capable of indicating the place where any injury has taken place, from an external cause, by augmenting the pain in the part, or renewing it if it have ceased to exist. The root seldom produces such disagreeable symptoms as the flowers, but as these are considered auspicious signs, they must not, we are told, be heeded unless violent. A little of the extract of gentian prevents its untoward effects on the stomach, and co-operates in its beneficial results; which are generally accompanied by an increase, but not velocity of pulse.



Myrtus Pimenta.

MYRTUS PIMENTA, *vel* PIMENTA VULGARIS.

Pimento, All-Spice, or Jamaica Pepper.

Class XII. Icosandria.—*Order* I. Monogynia.

Nat. Ord. Hesperideæ, *Lin.* Myrti, *Juss.* Myrtineæ, *De Cand.* Myrtoideæ, *Vent.* Myrtaceæ, *Brown.*

Gen. Char. *Calyx* 5-cleft, superior. *Petals* five. *Berry* two or three-celled, many-seeded.

Spec. Char. *Leaves* oblong-lanceolate. *Flowers* in three-forked panicles.

Syn.—Amomum quorundam odore Caryophylli, *Clus. Exot. lib.* 1. *c.* 17; *Bauh. Hist.* 2. *p.* 194.

Myrtus arborea aromatica, foliis laurinis, *Sloane's Jam. v.* 2. 76. *t.* 191. *f.*

Caryophyllus aromaticus Americanus, *Pluk. Alin.* 88. *t.* 155. *f.* 4.

Piper Jamaicense, *Black. t.* 355.

Bay-berry-tree, *Hughes Barbad. p.* 135. *t.* 10.

Myrtus Pimenta, *Lin. Sp. Pl.* 676; *Willd.* 2. 967; *Woodv. t.* 26; *Sims in Bot. Mag. t.* 1236.

Foreign.—*Poivre de la Jamaïque; Pimente; Toute-épice*, Fr.; *Gewürzmyrte; Jamaika Pfeffer*, Ger.; *Skryddpéppar*, Swed.

The Pimento or All-spice tree is a native of South America and of the West Indies. It succeeds well in our stoves, if allowed a strong heat, flowering copiously in May and June. It grows abundantly on the hilly parts of the north side of Jamaica, flowering in July, and soon afterwards ripening its fruit. It was cultivated by Philip Miller in 1732, but the date of its introduction is uncertain.

In its native soil this handsome evergreen tree usually rises with a straight or upright trunk to the height of thirty feet, branched towards the top, and covered with a smooth grey bark.

The leaves are opposite, on short foot-stalks, often two or three together, and vary in size and shape, but are commonly about four inches long, oblong-lanceolate, smooth, shining, pointed, and of a deep green colour. In their recent state, they have an agreeable aromatic taste, and abound in an essential oil, which appears in minute pellucid dots. The flowers are very numerous but small, and are produced in bunches or trichotomous panicles at the extremity of the branches. The calyx is divided into four roundish segments. The petals are four, reflected, and of a greenish-white colour. The filaments are numerous, longer than the corolla, spreading, of the same colour as the petals, supporting roundish white anthers. The style is simple, erect, with an obtuse stigma. The fruit is a smooth, shining, succulent berry, crowned with the persistent calyx, of a black or dark purple colour when ripe, and containing two kidney-shaped, flattish seeds.—Fig. (*a*) represents the fruit.

The pimento tree begins to bear fruit in three years after it is planted, and arrives at maturity at seven, when it abundantly repays the patience of the planter. It is particularly fond of a white marly or chalky soil, having a shallow surface of mould, and therefore grows well on those rocky lands which are fit for little else. The berries are picked from the branches in their green state, and are then laid on cloths spread on terraced floors. During the first and second days they are often turned, to be fully exposed to the sun. When they begin to dry they are frequently winnowed, and laid in cloths to preserve them from rain and dews, still being exposed to the sun every day, and removed under cover every evening, till sufficiently dry; which usually happens in twelve days, and is known by the darkness of their complexion and the rattling of the seeds. At this time they appear wrinkled, and are of a very dark brown colour, in which state they are stowed in bags or casks for market. Some planters kiln-dry them, and it seems the most eligible method, as dispatch and security against rain are so very essential, and especially when the crops are more than usually abundant.

The more odoriferous and smaller the berries are, the better

are they reckoned. The leaves and bark of the tree are full of aromatic inflammable particles, on account of which the growers are extremely cautious not to suffer any fire to be made near the walks, for if it once catch the trees, they consume with great rapidity. Nothing, it is said, can be more delicious than the odour of the walks in which the trees are planted, particularly when they are in blossom. The friction of the leaves and smaller branches, even in a gentle breeze, diffuse a most grateful fragrance through the air, which is thought to render it very salubrious.

Qualities and Chemical Properties.—The berries of the pimento have a resemblance in smell and taste to cloves, juniper-berries, cinnamon, and pepper, or rather a peculiar mixture, somewhat akin to them all; hence their name of *All-spice*. The aromatic odour and warm pungent taste reside chiefly in the rind, or cortical part of the berry. Its virtues are extracted by water, alcohol, and ether. The watery infusion is of a brown colour, and reddens infusion of litmus. With sulphate of iron it strikes a black colour, and lets fall a precipitate. Nitrate of mercury precipitates it of a yellowish brown; superacetate of lead, of a dirty green; and nitrate of silver, of a deep reddish brown colour. It forms a precipitate with the infusion of yellow bark. The sulphuric and muriatic acids redden it, and throw down a rose-coloured precipitate. The nitric acid forms no precipitate, but gives a yellow hue. The alcoholic tincture is rendered milky, and after a time precipitates by water; the ethereal, when evaporated in water, deposits drops of a greenish yellow volatile oil, a pellicle of pungent nauseous tasted resin, and some extractive. Hence pimento appears to contain a volatile oil, resin, extractive, tannin, and gallic acid. The essential oil is very grateful, and so ponderous as to sink in water.

Medical Properties and Uses.—As a condiment, pimento is very generally employed; and in medicine is much used as an adjunct to bitters in dyspepsia when attended with much flatulence; also in arthritic and hysterical affections. The watery infusion, sweetened with sugar and added to a little milk, is readily taken by children, and is an excellent cordial in malignant

measles, scarlatina, small-pox, and other fevers of a typhoid description. But it is principally employed to cover the taste of other medicines, and to impart warmth.

Off. Prep.—	Aqua pimenta.	L. E. D
	Oleum pimentæ.	L. E. D
	Pilulæ opiatæ.	E.
	Spiritus pimentæ.	L. E. D
	Syrupus rhamni.	L.



Laurus nobilis.

LAURUS NOBILIS.

Common Sweet-bay.

Class IX. Enneandria.—*Order* I. Monogynia.

Nat. Ord. H. Oloraceæ, *Lin.* Lauri, *Juss.* Laurineæ, *Vent.* Lauraceæ, *Burn.*

Gen. Char. *Calyx* corolla-like, 4 or 6-cleft. Innermost *filaments* bearing glands. *Anthers* 2-valved, gaping at the base. *Drupe* superior, one-seeded.

Spec. Char. *Leaves* lanceolate, veined, finely reticulated, evergreen. *Flowers* 4-cleft, dicœcious, in short axillary clusters.

Syn.—Laurus vulgaris, *Bauh. Pin.* 460; *Tourn. Inst.* 597.
Laurus, *Matth. Valgr. v.* 119; *Bauh. Hist. v.* 1. *p.* 1. 409; *Camer. Epit.* 60 *Ger. Em.* 1407.
Δαφνη, Diosc. *lap.* 1. *cap.* 106.
Laurus nobilis, *Lin. Sp. Pl.* 529; *Willd. v.* 2. 479; *Ait. Hort. Kew. ed.* 2d. 428; *Zarn. Icon.* 52; *Fl. Groca Sibth. v.* 4. *t.* 265.

Foreign.—*Laurier commun*, Fr.; *Alloro, Lauro*, It.; *Laurel*, Sp.; *Loiro*; *Loriero*, Port.; *Gemeine Lorbeerbaum*, Germ.; *Lagerbärsträd*, Swed.; *Lawr*, Russ.

The Sweet-bay, which is a considerable tree in the South of Europe, appears but as a shrub in this country, producing its flowers only in sheltered situations in April and May. It is a hardy evergreen, a native of Italy and Greece; being without doubt the δαφνη of Dioscorides, and consequently the classical laurel.

In its native soil and climate the Sweet-bay frequently rises twenty or thirty feet in height; much branched, and covered with a smooth, olive-coloured bark. The leaves lanceolate about three inches long, but varying in size, on short, channelled foot-stalks, alternate, pointed, smooth, veined, entire, often waved at the margin, of a firm texture, and deep green colour. The flowers are male and female on different plants; they appear in short racemes, and stand upon short, smooth pedicles at the

axillæ of the leaves. The corolla in both descriptions of flowers, is divided into four oval, concave segments, which stand erect, and are of an herbaceous, or yellowish white colour. The filaments are as long as the calyx; the four outer ones simple, the rest compound, bearing two lateral glands, or abortive anthers. The true anthers are yellow, ovate, bilocular, and composed of two valves, with a recurved dehiscence. The style of the female flowers is very short, and the germen becomes an oval drupe, which is fleshy, very smooth, of a dark purple, or almost black colour, and containing a large nut of a similar shape. Fig. (*a*) the male flower magnified; (*b*) the drupe or berry; (*c*) the nut.

Qualities.—Both the *leaves* and *berries* have a sweet odour, and an aromatic, astringent, bitter taste. The fruit yields by distillation a brown volatile oil: and by expression and boiling in water, a green fixed oil, which is recommended to be employed internally; but the article known in commerce by the name of *oil of bays*, is made by boiling the berries in hog's-lard, to which they impart their colour and some little odour. The leaves are said to contain prussic acid. But although the assertion has been often made, its correctness is doubtful. We have not been able to find any record of experiments upon the subject, therefore cannot but agree with Dr. Hancock in the belief that the statement has arisen from erroneously confounding this, which is the *true laurel* or *bay*, with the Lauro-cerasus or *cherry* laurel, the poisonous properties of which have already been described; and this the more especially, as the presence of prussic acid in the bay would be an anomaly in the natural group to which the plant belongs.

Medical Properties and Uses.—The leaves and berries of this tree are somewhat carminative and sedative. In former times they were employed in flatulent colic, hysteria, and uterine affections, but they are never prescribed by modern practitioners, either internally or externally, and might without loss be expunged from the materia medica.

END OF VOL. II.

IBOTSON AND PALMER, PRINTERS, SAVOY STREET, STRAND.